

**To:** Eric Bowman  
Environmental Quality Management

**Date:** October 4, 2013

**From:** Brian Boyer  
Patricia Hoch-Melluish  
Kieser & Associates, LLC

**cc:** Project files

**RE:** Portage Creek Area Time Critical Removal Action  
Project# 030281-0087  
Yr-1 Vegetation Assessments

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### Introduction

Kieser & Associates, LLC (K&A) has been retained by Environmental Quality Management, Inc. (EQM) to provide professional services for re-vegetation monitoring (K&A Work Task 3) associated with the Portage Creek Area Time Critical Removal Action Project in Kalamazoo, Michigan. This technical memorandum summarizes the year-1 findings associated with re-vegetation monitoring.

A site location map depicting the location of each Portage Creek sediment removal work site, with respect to each other and local surrounding features, is provided as Figure 1. K&A efforts for re-vegetation monitoring included five sites that were completed in the fall of 2012. These sites included: SA-7, SA-6, SA-5D, SA-5 Axtell and SA-5C.

### Work Summary and Findings

K&A personnel accessed each restored sediment removal work site on foot to assess the general condition of re-vegetation species present within the designated sediment removal work areas. These vegetation evaluation efforts were a qualitative assessment to monitor year-1 progress of re-vegetation, recommend corrective action, and presence of invasive species.

The first vegetation assessment was conducted in early summer on June 17, 2013 and the second vegetation assessment was conducted in late summer on September 16, 2013.

Field notes were recorded for each site to document plant species (seed and plugs), trees and shrubs that were previously part of each site restoration effort. Observed vegetation conditions, recommended corrective action and observed invasive species were documented for each site. Photograph documentation was also recorded to illustrate observed conditions. A copy of the June 17, 2013 vegetation assessment field notes is provided in Attachment A, and a copy of the September 16, 2013 vegetation assessment field notes is provided in Attachment B.



# **ATTACHMENT A**

Year-1 Vegetation Monitoring  
Observations, Recommendations and Photograph Documentation  
**June 17, 2013**



**KIESER & ASSOCIATES**  
**EQM Vegetation Progress Monitoring**  
**June 17, 2013 (Year 1-qualitative)**

**SA-5C**

- Plug areas near Crosstown Parkway not thriving-weedy and dry. **May require some replacement plugs. Will reassess in late summer monitoring** (Photo 1).
- Crabapple tree on west side of creek not thriving or leafing out. **May require replacement. Will reassess in late summer monitoring** (Photo 2).
- All other trees and shrubs look healthy.
- East side turf grass very sparse, especially at the southern end (Photo 3). **Reseeding is recommended.**
- West side turf grass filling in well.
- Many invasive, weedy species establishing along east creek bank. (Purple loosestrife, curled dock, pokeweed, plantain, reed canary grass, stinging nettles, bindweed). **Some management (weeding, herbicide) may be required. Will reassess in late summer monitoring.**
- Many invasive, weedy species establishing along west creek bank. (Purple loosestrife, curled dock, reed canary grass, nightshade, yellow iris) **Some management (weeding, herbicide) may be required. Will reassess in late summer monitoring.**

**SA-5 Axtell Creek**

- One flowering dogwood tree on north bank not thriving or leafing out (Photos 1 and 2). **May require replacement. Will reassess in late summer monitoring.**
- All other trees and shrubs look healthy.
- Existing mulberry tree on north bank has large downed limb. **Removal is recommended.**
- North side turf grass is establishing well with little to no sparse areas.
- Some invasive, weedy species establishing along north creek bank. (Purple loosestrife, curled dock). **Some management (weeding, herbicide) may be required. Will reassess in late summer monitoring.**
- **Would recommend additional tree/shrub planting along south bank.**

**SA-5D**

- Plug areas near Lake Street confluence not thriving-weedy and dry. **May require some replacement plugs. Will reassess in late summer monitoring** (Photos 1 and 2).
- Prairie seed mix sparse in a small area near Lake Street, west side creek (Photo 3). **May require reseeding. Will reassess in late summer monitoring.**
- East side turf grass south of Axtell Creek confluence very sparse (Photos 4 and 5). **Reseeding is recommended.**
- Plug areas near Axtell Creek confluence footbridge not thriving-weedy and dry. The areas are getting foot traffic and the plugs appear to be stepped on. **May require some replacement plugs. Will reassess in late summer monitoring** (Photos 6 and 7).

**KIESER & ASSOCIATES**  
**EQM Vegetation Progress Monitoring**  
**June 17, 2013 (Year 1-qualitative)**

- East side turf grass north of Axtell Creek confluence very sparse (Photo 8). **Reseeding is recommended.**
- Some invasive, weedy species establishing along west creek bank. (Purple loosestrife, curled dock, daisy fleabane, moth mullein, yellow sweet clover, creeping charley, nightshade, reed canary grass, pokeweed.) **Some management (weeding, herbicide) may be required. Will reassess in late summer monitoring.**
- Some invasive, weedy species establishing along east creek bank. (Purple loosestrife, curled dock, reed canary grass, giant ragweed, burdock, nightshade, stinging nettles, morning glory, daisy fleabane.) **Some management (weeding, herbicide) may be required. Will reassess in late summer monitoring.**
- All trees and shrubs look healthy.

**SA-6**

- Plug area near Stockbridge, west side of creek, well-tended and healthy (Photo 1).
- Could not find the three elderberry and two red-osier dogwoods near Stockbridge, east side of creek. **Installation of the five shrubs will be required.**
- All trees and shrubs that could be found look healthy.
- Prairie seed mix area sparse near Lake Street, west side of creek (Photo 2). **May require reseeding. Will reassess in late summer monitoring.**
- Some coir log slumping near Lake Street, east side of creek (Photos 3 and 4). Erosion doesn't appear to be a problem. **Will reassess in late summer monitoring.**
- Growth along both banks generally dense, but many invasive, weedy species present. (Purple loosestrife, curled dock, reed canary grass, buckthorn, thistle, moth mullein, cow vetch, yellow sweet clover, stinging nettles, nightshade, pokeweed.) **Some management (weeding, herbicide) may be required. Will reassess in late summer monitoring.**

**SA-7**

- Seeding is filling in well (Photo 1). Sparse in some areas, but overall good coverage. **Will reassess in late summer monitoring.**
- Some invasive, weedy species establishing on site. (Curled dock, yellow sweet clover, thistle, cow vetch, moth mullein.) **Some management (weeding, herbicide) may be required. Will reassess in late summer monitoring.**
- All spicebush plants appear to be struggling, but starting to leaf out (Photo 2). **May require replacement. Will reassess in late summer monitoring.**
- All other trees and shrubs look healthy.



**Photograph 1:** Plug area near Crosstown Parkway, east side of Portage Creek.



**Photograph 2:** Crabapple tree-poor leaf out, Crosstown Parkway, east side of Portage Creek.



**Photograph 3:** Bare turf grass area looking south from Vine Street, east side Portage Creek.





**Photograph 1:** Flowering dogwood tree – not thriving



**Photograph 2:** Flowering dogwood tree – not thriving





**Photograph 1:** Plug area near Lake Street, west side of Portage Creek.



**Photograph 2:** Plug area near Lake Street, east side of Portage Creek.





**Photograph 3:** Bare area looking south toward Lake Street, west side Portage Creek.



**Photograph 4:** Bare turf grass area looking north near Lake Street, east side Portage Creek.





**Photograph 5:** Bare turf grass area south of Axtell Creek confluence, east side of Portage Creek.



**Photograph 6:** Plug area looking north near Axtell Creek confluence, east side Portage Creek.





**Photograph 7:** Plug area north of Axtell Creek confluence, east side of Portage Creek.

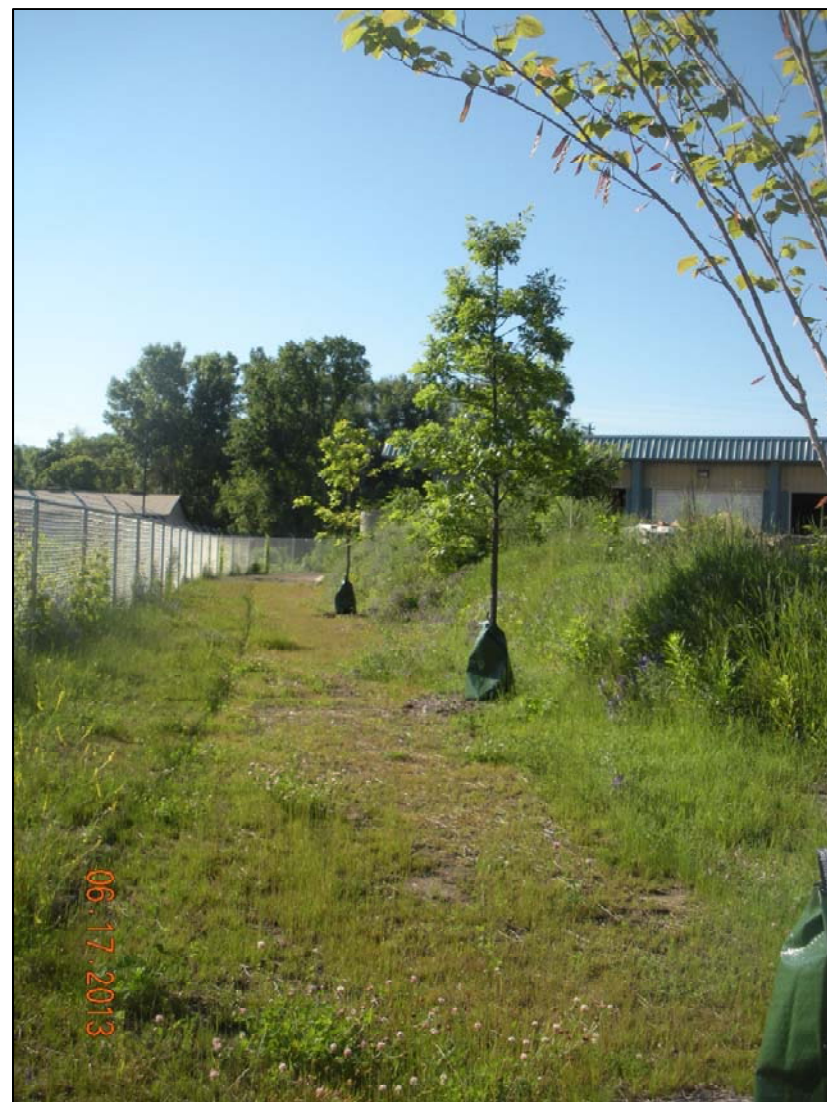


**Photograph 8:** Turf grass area looking south near Axtell Creek confluence, east side Portage Creek.





**Photograph 1:** Plug area near Stockbridge Avenue, west side of Portage Creek.



**Photograph 2:** Prairie area looking south from Lake Street, west side Portage Creek.





**Photograph 3:** Prairie slope area near Lake Street, east side of Portage Creek.



**Photograph 4:** Coir log near Lake Street, east side Portage Creek.





**Photograph 1:** Prairie area near Reed Street, west side of Portage Creek.



**Photograph 2:** Spice bush-poor leaf out, west side Portage Creek.

# **ATTACHMENT B**

Year-1 Vegetation Monitoring  
Observations, Recommendations and Photograph Documentation  
**September 16, 2013**

**KIESER & ASSOCIATES**  
**EQM Vegetation Progress Monitoring**  
**September 16, 2013 (Year 1-qualitative)**

**SA-5C**

- Plug areas near Crosstown Parkway not thriving. **May require some replacement plugs. Needs protection from foot traffic and maintenance during establishment period** (Photo 1).
- Crabapple tree on west side of creek not thriving. **Will require replacement.** (Photo 2).
- One elderberry on west side of creek near Crosstown Parkway not thriving. (Photo 3). All other trees and shrubs look healthy. **Will reassess spring 2014.**
- East side turf grass still fairly sparse, especially at the southern end (Photo 4). It appears that a portion of the area to the north has been recently reseeded. **Additional reseeding is recommended.**
- Many invasive, weedy species establishing along both creek banks. (Purple loosestrife, curled dock, pokeweed, plantain, reed canary grass, stinging nettles, bindweed, ragweed, evening primrose, chicory). **Some management (weeding, herbicide) may be required to control invasives.**

**SA-5 Axtell Creek**

- Two flowering dogwood trees on north bank not thriving or leafing out (Photo 1). **Will require replacement.**
- One beech tree on north bank not thriving. All other trees and shrubs look healthy. **Will reassess in spring 2014.**
- Existing mulberry tree on north bank has large downed limb since early summer monitoring. **Removal is recommended.**
- North side turf grass is establishing well with little to no sparse areas.
- Plug area on north bank not thriving. (Photo 2). **May require some replacement plugs. Needs protection from foot traffic and maintenance during establishment period.**
- Many invasive, weedy species establishing along both creek banks. (Purple loosestrife, curled dock, pokeweed, buckthorn, honeysuckle). **Some management (weeding, herbicide) may be required to control invasives.**

**SA-5D**

- Plug areas near Lake Street not thriving. **May require some replacement plugs. Needs protection from foot traffic and maintenance during establishment period** (Photos 1 and 2).
- Prairie seed mix has filled in since early summer monitoring in a small area near Lake Street, west side creek.
- East side turf grass south of Axtell Creek confluence has filled in slightly since early summer monitoring, but still not very dense (Photos 3 and 4). **Reseeding is recommended.**
- Plug area south of Axtell Creek confluence footbridge not thriving. The area is getting foot traffic and the plugs appear to be stepped on. **May require some**

**KIESER & ASSOCIATES**  
**EQM Vegetation Progress Monitoring**  
**September 16, 2013 (Year 1-qualitative)**

**replacement plugs. Needs protection from foot traffic and maintenance during establishment period** (Photos 5 and 6).

- Plug area north of Axtell Creek confluence footbridge beginning to establish. The area is getting foot traffic and the plugs appear to be stepped on. **May require some replacement plugs. Needs protection from foot traffic and maintenance during establishment period** (Photo 7)
- East side turf grass north of Axtell Creek confluence very sparse (Photo 8). **Reseeding is recommended.**
- Many invasive, weedy species establishing along creek banks. (Purple loosestrife, curled dock, giant ragweed, pokeweed, evening primrose, burdock.) **Some management (weeding, herbicide) may be required to control invasives.**
- Planting bed on east side near Crosstown Parkway looks good. **Maintenance (weeding) may be required.**
- Dogwood on west side of creek north of Axtell not thriving. All other trees and shrubs look healthy. **Will reassess in spring 2014.**

**SA-6**

- Plug area near Stockbridge, west side of creek, not thriving. **Will reassess in spring 2014.** (Photo 1).
- Could not find the three elderberry and two red-osier dogwoods near Stockbridge, east side of creek. **Installation of the five shrubs will be required.**
- All trees and shrubs that could be found look healthy.
- Prairie seed mix area filling in since early summer survey near Lake Street, west side of creek (Photo 2).
- No erosion areas observed along creek banks.
- Growth along both banks generally dense, but many invasive, weedy species present. (Purple loosestrife, curled dock, reed canary grass, buckthorn, thistle, moth mullein, cow vetch, yellow sweet clover, stinging nettles, nightshade, pokeweed.) **Some management (weeding, herbicide) may be required to control invasives.**
- Japanese knotweed reestablishing near Stockbridge on west side of creek. **Management will be required.**

**SA-7**

- Densely vegetated, but a little weedy. Invasives establishing onsite (spotted knapweed, pokeweed, stinging nettles, curled dock, white sweet clover, common ragweed, thistle) (Photo 1). **Some management (weeding, herbicide) may be required to control invasives.**
- Spicebush plants have recovered since the early summer survey and appear to be healthy (Photo 2).
- Rose bushes look a little weak-may be due to herbivory. Deer were observed on site. All other trees and shrubs look healthy.
- Downed limb across property (Photo 3). **May need removal.**





**Photograph 1:** Plug area near Crosstown Parkway, east side of Portage Creek.



**Photograph 2:** Crabapple tree-poor leaf out, Crosstown Parkway, west side of Portage Creek.





**Photograph 3:** Elderberry bush, not thriving, Crosstown Parkway, west side of Portage Creek.



**Photograph 4:** Bare turf grass area looking north from Crosstown Parkway, east side Portage Creek.





**Photograph 1:** Flowering dogwood tree – needs replacement



**Photograph 2:** Plug area north side of creek





**Photograph 1:** Plug area near Lake Street, west side of Portage Creek.



**Photograph 2:** Plug area near Lake Street, east side of Portage Creek.





**Photograph 3:** Bare turf grass area looking north near Lake Street, east side Portage Creek.



**Photograph 4:** Bare turf grass looking south in the area south of Axtell Creek confluence, east side of Portage Creek.





**Photograph 5:** Plug area near Axtell Creek confluence, east side Portage Creek.



**Photograph 6:** Plug area looking north near Axtell Creek confluence, east side Portage Creek.





**Photograph 7:** Plug area north of Axtell Creek confluence, east side of Portage Creek.



**Photograph 8:** Turf grass area looking north near Axtell Creek confluence, east side Portage Creek.





**Photograph 1:** Plug area near Stockbridge Avenue, west side of Portage Creek.



**Photograph 2:** Prairie area looking south from Lake Street, west side of Portage Creek.





**Photograph 1:** Prairie area near Reed Street, west side of Portage Creek.



**Photograph 2:** Spice bush , west side Portage Creek.

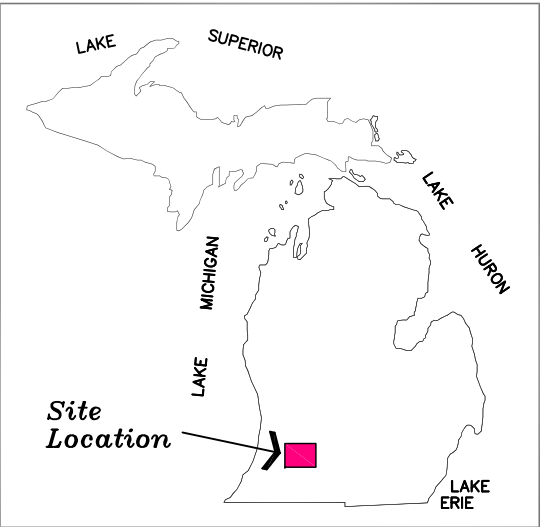


**Photograph 3:** Downed limb, west side of Portage Creek.



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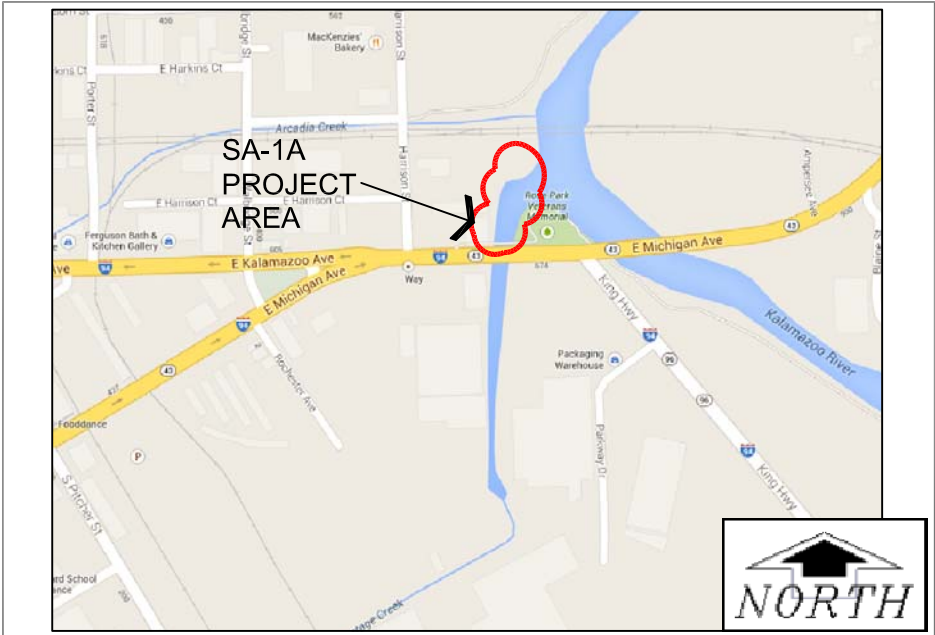
KALAMAZOO COUNTY, MICHIGAN



# PORTAGE CREEK TIME CRITICAL REMOVAL ACTION KALAMAZOO, MICHIGAN

EQM PROJECT NUMBER 030281.0087

PORTAGE CREEK - SITE SA-1A



SITE LOCATION MAP

## INDEX OF DRAWING SHEETS

- |     |                            |
|-----|----------------------------|
| 1   | Cover Sheet                |
| 2   | Site SA-1A Vegetation Plan |
| 3   | Detail Drawings            |
| 4   | Detail Drawings            |
| 5   | Quantities                 |
| 6-8 | Specifications             |

## EROSION CONTROLS

1. ALL CONSTRUCTION SHALL COMPLY WITH THE SOIL EROSION AND SEDIMENTATION CONTROL ACT (P.A. 347 OF 1972, AS AMENDED).
2. ALL TEMPORARY EROSION CONTROLS SHALL BE REMOVED ONCE CONSTRUCTION IS COMPLETE.
3. TEMPORARY EROSION CONTROL MEASURES SHALL BE INSTALLED PRIOR TO COMMENCING WORK, TO THE EXTENT POSSIBLE.
4. CONTRACTOR TO PROTECT ONSITE CATCH BASINS FROM DAMAGE AND SEDIMENTATION.
5. ENSURE PROPER DRAINAGE FOLLOWING BACKFILL.
6. CONTRACTOR SHALL MONITOR AND MAINTAIN ALL SOIL EROSION CONTROL MEASURES FOR THE DURATION OF THE CONSTRUCTION PERIOD.
7. SUPPLEMENTAL SOIL EROSION CONTROLS SHALL BE INSTALLED AS NEEDED TO ENSURE

## GENERAL NOTES:

1. The Contractor is responsible for contacting MISS DIG (1-800-482-7171) at least 3 working days before construction begins. The Contractor shall provide the MISS DIG ticket number upon request. Any utility conflicts must be presented to the Engineer in writing prior to commencement of work.
2. With EPA oversight, Contractor is not required to obtain permits for re-vegetation work.
3. The Contractor is responsible for knowing and following all appropriate safety standards which are required by the Michigan Occupational Safety and Health Act.
4. Hard hats must be worn by anyone on the site who may be exposed to falling objects or flying debris and anyone within the operating range of overhead construction equipment. This equipment includes, but is not limited to, backhoes, cranes, draglines, and front end loaders.
5. Any deviation from these construction drawings and specifications will be considered defective work, subject to modification for conformance at the Contractor's expense.
6. Contractor shall keep disturbance of all areas of construction to a minimum.
7. Locations and elevations of existing utilities are not exact. Contact Miss Dig at 1-800-482-7171, prior to beginning construction.
8. Existing utilities destroyed or disturbed by the Contractor's operations shall be repaired at the Contractor's expense.
9. Hand dig in all areas of existing utilities.
10. The contractor shall be required to prevent movement of soil off site. Additional silt fencing may be required beyond that already on-site. Any additional silt fencing shall be incidental to work.
11. All work shall be checked for accuracy to the plans by the Contractor prior to installation.

CITY OF KALAMAZOO  
<http://www.kalamazoo.org/onlinegis/CXviewer.htm>  
T2s R11w, SE 1/4 of Section 22  
in Kalamazoo County, Michigan.



Know what's below.  
Call before you dig.  
1-800-482-7171

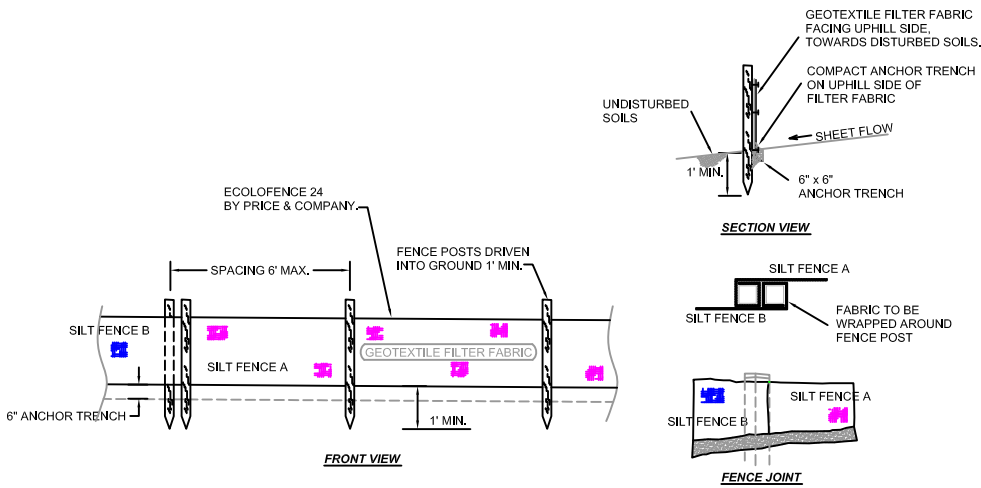
NOTES:  
ALL EXISTING UTILITY LOCATIONS DEPICTED ON THESE PLANS ARE APPROXIMATE; BASED ON AVAILABLE INFORMATION AND FIELD OBSERVATIONS BY OTHERS. AS A RESULT, UTILITY LOCATIONS SHOWN ARE NOT EXACT. DO NOT ASSUME THESE ARE THE ONLY UTILITIES PRESENT.

NOTE TO CONTRACTOR:  
3 FULL WORKING DAYS BEFORE YOU DIG, CALL "MISS DIG".

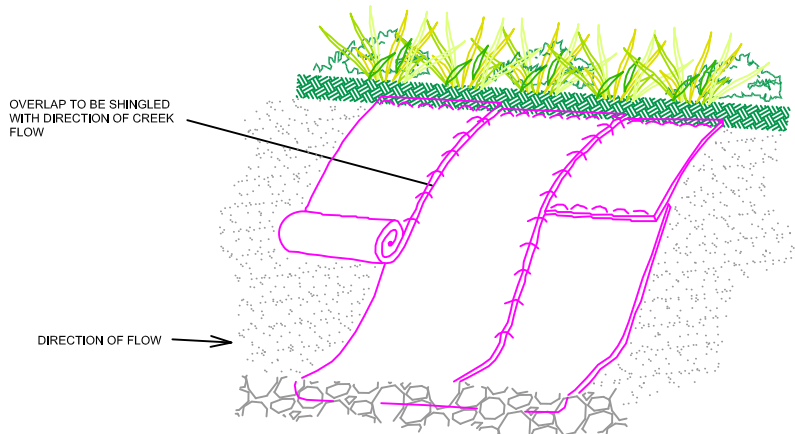






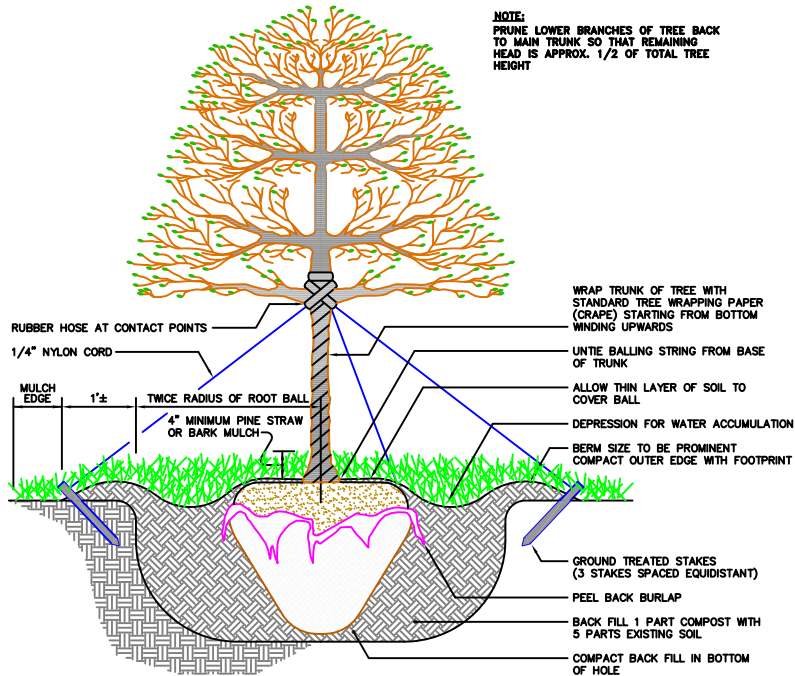


1 SOIL EROSION CONTROL  
GEOTEXTILE SILT FENCE  
NO SCALE

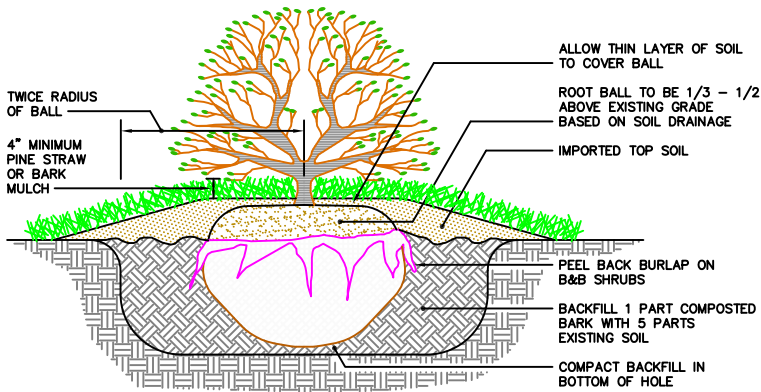


2 EROSION CONTROL BLANKET DETAIL  
NO SCALE

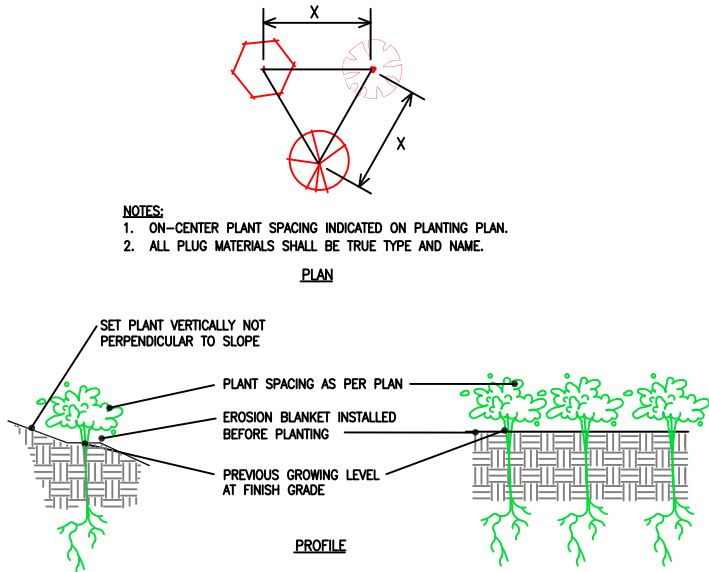
- NOTES:**
1. PREPARE SOIL BEFORE INSTALLING BLANKETS, INCLUDING APPLICATION OF SEED.
  2. BEGIN AT THE TOP OF THE SLOPE BY ANCHORING THE BLANKET IN A 6" DEEP BY 6" WIDE TRENCH. BACKFILL AND COMPACT THE TRENCH AFTER PINNING.
  3. ROLL THE BLANKETS DOWN THE SLOPE IN THE DIRECTION OF THE WATER FLOW.
  4. THE EDGES OF PARALLEL BLANKETS MUST BE PINNED WITH APPROXIMATELY 2" OVERLAP.
  5. WHEN BLANKETS MUST BE SPICED DOWN THE SLOPE, PLACE BLANKETS END OVER END (SHINGLE STYLE) WITH APPROXIMATELY 6" OVERLAP. STAPLE THROUGH OVERLAPPED AREA, APPROXIMATELY 12" APART.
  6. BLANKETS SHALL BE PINNED IN ROWS NOT MORE THAN 2 FT O.C. WITH A MAXIMUM OF 20" BETWEEN PINS, 3.5 PINS PER SQ YD.
  7. LOWER END OF BLANKET TO BE TUCKED 6" MIN. BELOW EDGE OF TOE.



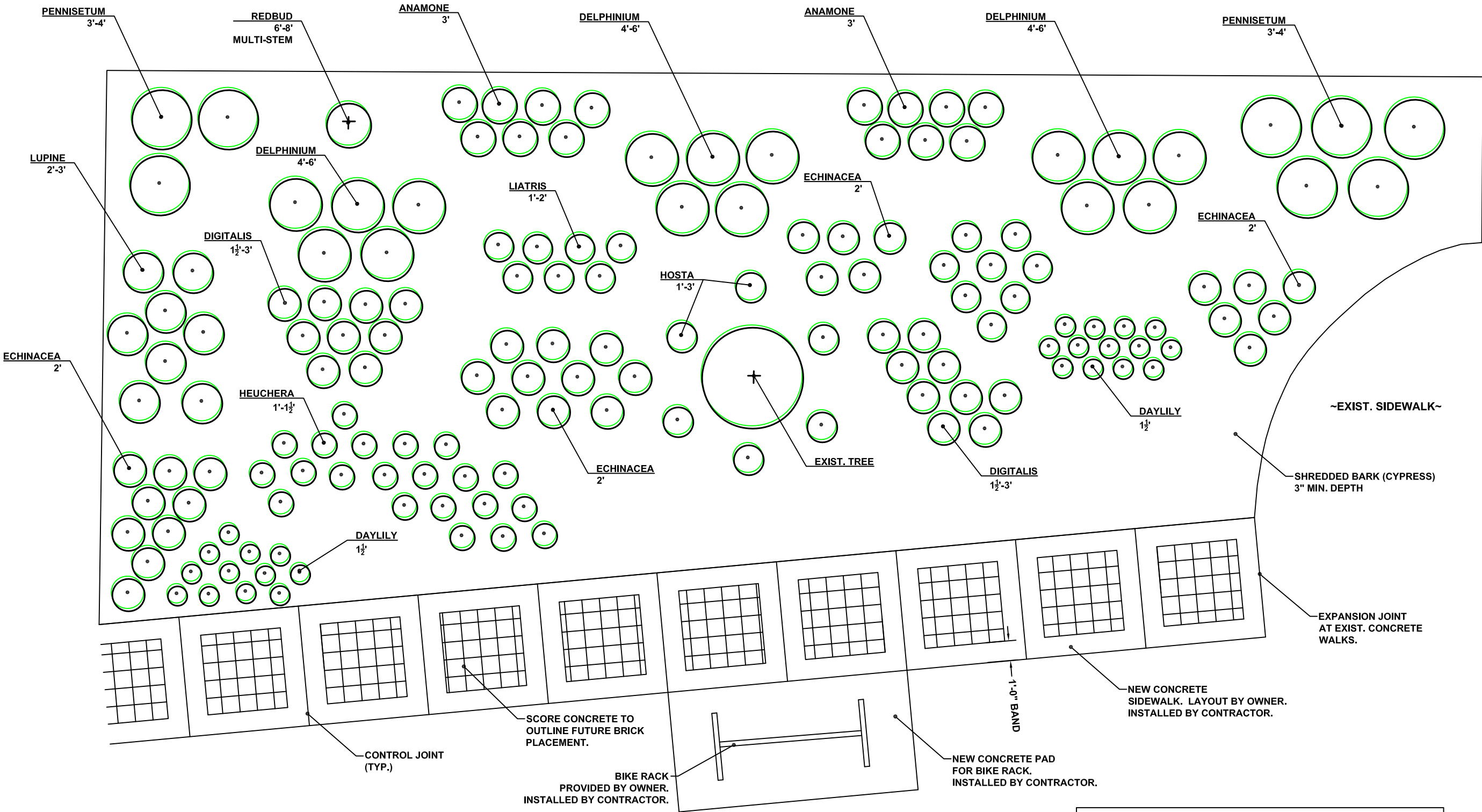
3 STAKING AND PLANTING  
TREE DETAIL  
NO SCALE



4 SHRUB DETAIL  
CONTAINER AND B&B  
NO SCALE



5 PLANTING  
GROUND COVER - NO SCALE



6

**DETAIL - PLANTING AREA #2**  
**ROSE PARK ORNAMENTAL GARDEN**

- NOTES:**
- 1. ALL PERENNIALS TO BE 1-GALLON.
  - 2. SPACING AS NOTED ABOVE.
  - 3. LAYOUT/STAKED BY OWNER.
  - 4. INSTALLED BY CONTRACTOR.
  - 5. IRRIGATION TO BE REPAIRED PRIOR TO ALL WORK.

Area #1 - Plugs (City Property next to Bridge)

Common Name	Scientific Name	QTY.	UNIT
Threadleaf coreopsis	<i>Coreopsis verticillata</i>	10	EA
Black eyed susan	<i>Rudbeckia hirta</i>	10	EA
Smooth penstemon	<i>Penstemon digitalis</i>	10	EA
Prairie dropseed	<i>Sporobolus heterolepis</i>	10	EA
Prairie blazingstar	<i>Liatris pycnostachya</i>	10	EA
Butterfly weed	<i>Asclepias tuberosa</i>	10	EA

AREA #2 - PLANTS

City of Kalamazoo  
Rose Park Ornamental Garden Plan 2013

Plant Quantities and Specifications

14-one gallon ANEMONE-White

*Honorine Joberit*

3'-3 ½' Height

1 ½' Spread

August

6 – one gallon HOSTA-Variegated

*Patriot*

1'-3' Height

1'-3' Spread

June/July

25 – one gallon DAYLILY-Red

*Pardon Me*

1 ½' Height

1' Spread

July/August

7 – one gallon LIATRIS-White

*Spicata Alba*

3'-4' Height

1'-2' Spread

July/August

15 – one gallon DELPHINIUM-Blue

*Blue Bird*

4'-6' Height

2'-3' Spread

June

8- one gallon LUPINE-White

*Noble Maiden*

2'-3' Height

2' Spread

June

18 – one gallon DIGITALIS-MIX

*Foxy Mix*

1 ½'-3' Height

1 ½'-2' Spread

July

8 – one gallonPENNISETUM-Red

*Red Head*

3'-4' Height

3' Spread

July/August

30 – one gallon ECHINACEA-Red

*Sombrero Salsa Red*

22"-2' Height

1'-2' Spread

June-August

8 – one gallon PLATYCODON-White

*Fuji White*

1'-2' Height

1 ½' Spread

June/July












21 – one gallon HEUCHERA-Red

*Autumn Leaves*

8"-1' Height

1'-1 ½' Spread

July-August

QUANTITIES (SA-1A)		
ITEM DESCRIPTION	QTY.	UNIT
SOIL ROUGHENING/SCARIFICATION	2.01	AC
NATIVE SEED MIX (WP-7)	0.1	AC
NATIVE SEED MIX (DP-4)	0.12	AC
"NO-MOW" LAWN MIX	0.83	AC
"TYPE-A" LAWN MIX	0.13	AC
DS75 MULCH BLANKET	0.31	AC
CYPRESS SHREDDED MULCH	33	CYD
RYERSON STEEL EDGING	200	LFT
CONCRETE SIDEWALK	510	SFT
WHITE OAK 	4	EA
RED MAPLE 	3	EA
SILVER MAPLE 	1	EA
RIVERBIRCH (MULTI-STEM) 	3	EA
REDBUD  (1 MULTI-STEM)	5	EA
SERVICEBERRY 	1	EA
SWAMP WHITE OAK 	1	EA
NINEBARK 	7	EA
KALM'S ST JOHN'S WORT 	3	EA
SHADBLOW SERVICEBERRY 	5	EA
RED-OSIER DOGWOOD 	29	EA

Area #3 - Plugs (Starworld Property)

Common Name	Scientific Name	QTY.	UNIT
Threadleaf coreopsis	<i>Coreopsis verticillata</i>	40	EA
Black eyed susan	<i>Rudbeckia hirta</i>	40	EA
Smooth penstemon	<i>Penstemon digitalis</i>	39	EA
Prairie dropseed	<i>Sporobolus heterolepis</i>	39	EA
Prairie blazingstar	<i>Liatris pycnostachya</i>	39	EA
Butterfly weed	<i>Asclepias tuberosa</i>	39	EA
	<i>Symphotrichum novae</i>		
New England aster	<i>angliae</i>	39	EA

Area #4 - Plugs (Tool & Die Property along Tracks)

Common Name	Scientific Name	QTY.	UNIT
Threadleaf coreopsis	<i>Coreopsis verticillata</i>	36	EA
Black eyed susan	<i>Rudbeckia hirta</i>	36	EA
Smooth penstemon	<i>Penstemon digitalis</i>	36	EA
Prairie dropseed	<i>Sporobolus heterolepis</i>	36	EA
Prairie blazingstar	<i>Liatris pycnostachya</i>	36	EA
Butterfly weed	<i>Asclepias tuberosa</i>	35	EA
	<i>Symphotrichum novae</i>		
New England aster	<i>angliae</i>	35	EA



SA-1A VEGETATION

PART 1.        GENERAL

1.01    SECTION INCLUDES

- A.    Preparation of grades to receive seeding and vegetation.
- B.    Seeding.
- C.    Seed protection on slopes.
- D.    Planting special seed mixes.
  - 1.    WP-7 (Short Stature Bioswale Mix)
  - 2.    DP-4 (Short Grass Prairie Erosion Control Seed Mix)
  - 3.    "No-Mow" Lawn Mix (6 Blend Custom Fescue Mix)
  - 4.    "Type-A" Lawn Mix (General Turf Grass Lawn Mix)
- E.    Maintenance and Warranty.

1.02    SUBMITTALS

- A.    Documentation must include the following:
  - 1.    Submit seed tags to Engineer prior to seeding.
  - 2.    Submit copy of invoice to media amendment.

1.03    QUALITY ASSURANCE

- A.    Grass seed shall meet the tolerance for germination and purity of the Official Seed Analyses of North America.

1.04    PRODUCT DELIVERY, STORAGE, AND HANDLING

- A.    Deliver seed in original containers showing analysis of seed mixture, percentage of pure seed, year of production, net weight, date of testing, and location of packaging. Damaged packages are not acceptable.

1.05    EXISTING CONDITIONS

- A.    Beginning work means acceptance of existing conditions.

PART 2.        PRODUCTS

2.01    GROWING MEDIA

- A.    Topsoil
  - 1.    Existing topsoil shall be re-used.
  - 2.    Import additional topsoil as needed to achieve min. 6 inches depth for upland areas to minimize weed seed viability.
- B.    Water
  - 1.    To be furnished by the Contractor. Portage Creek is an acceptable source.

2.02    SEED

- A.    Seed shall be new crop, cleaned, and comprising of the following varieties mixed in proportion by weight shown and testing the minimum percentages and germination indicated as follows:

2.03    SEED MIXTURES

- A.    All special native seed mixes shall be purchased from the following supplier:
  - 1) **Heartland Restoration Services, Inc.**                      **Contact:** Eric Ummel  
14921 Hand Road  
Fort Wayne, Indiana 46818  
Ph: (260) 489-8511  
Fx: (260) 489-8607  
Email: [mail@earthsourceinc.net](mailto:mail@earthsourceinc.net)

Trees, shrubs and plugs (refer to tree/shrub schedule on the drawings) shall be purchased from the following supplier(s) to the extent possible (as current stock allows):

- 2) **Great Lakes Landscape Supply**  
15200 Cedar Springs Ave NE  
Cedar Springs, MI 49319  
Ph: (616) 696-5665  
Fax: (616) 696-5785  
Email: [info@greatlakeslandscapesupply.com](mailto:info@greatlakeslandscapesupply.com)
- 3) **Wildtype Native Plant Nursery**                                      **Contact:** Bill Schneider  
900 N. Every Road  
Mason, MI 48854  
Ph: (517) 244-1140  
Fax: (517) 244-1142  
E-mail: [wildtype@msu.edu](mailto:wildtype@msu.edu)
- 4) **Hidden Savanna Nursery**    **Contact:** Chad Hughson  
18 N Van Kal Street  
Kalamazoo, MI 49009  
Ph: (269)352-3876  
Email: [info@hiddensavanna.com](mailto:info@hiddensavanna.com)
- 5) **American Roots**    **Contact:** Trish Hacker-Henning  
1958 Hidden Lake Trail  
Ortonville, MI 48462  
Ph: (248) 627-8525 or (248) 882-7768  
Fax: (248) 627-3865  
Email: [americanrootsnat@aol.com](mailto:americanrootsnat@aol.com)
- 6) **Sandhill Farm**    **Contact:** Cheryl Tolley  
11250 10 Mile Road  
Rockford, MI 49341-7954  
Ph: (616) 691-8214  
Fax: (616) 691-7872  
Email: [cheryl@iserv.net](mailto:cheryl@iserv.net)

B. Special Native Seed Mixes

1) **Short Stature Bioswale Mix (WP-7)**

Approximate mix weight 72 lb/acre with 68 native seeds/sq. ft.  
63.5% Grasses/Sedges/Rushes; 36.5% Forbs

Scientific Name	Common Name	Percent of Mix Category
<b>Grasses, Sedges, and Rushes</b>		
<a href="#"><i>Calamagrostis canadensis</i></a>	<a href="#">Blue Joint Grass</a>	22.71%
<a href="#"><i>Carex frankii</i></a>	<a href="#">Frank's Sedge</a>	2.99%
<a href="#"><i>Carex granularis</i></a>	<a href="#">Meadow Sedge</a>	1.97%
<a href="#"><i>Carex normalis</i></a>	<a href="#">Spreading Oval Sedge</a>	12.24%
<a href="#"><i>Carex shortiana</i></a>	<a href="#">Short's Sedge</a>	2.84%
<a href="#"><i>Carex stipata</i></a>	<a href="#">Stalk Grain Sedge</a>	1.81%
<a href="#"><i>Carex tribuloides</i></a>	<a href="#">Blunt Broom Sedge</a>	12.24%
<a href="#"><i>Carex vulpinoidea</i></a>	<a href="#">Fox Sedge</a>	11.68%
<a href="#"><i>Elymus virginicus</i></a>	<a href="#">Virginia Wild Rye</a>	17.95%
<a href="#"><i>Leersia oryzoides</i></a>	<a href="#">Rice Cut Grass</a>	13.57%
<b>Total</b>		<b>100.00%</b>
<b>Forbs</b>		
<a href="#"><i>Bidens cernua</i></a>	<a href="#">Nodding Bur Marigold</a>	7.29%
<a href="#"><i>Echinacea purpurea</i></a>	<a href="#">Purple Coneflower</a>	1.91%
<a href="#"><i>Euthamia graminifolia</i></a>	<a href="#">Flat-top Fragrant Goldenrod</a>	8.07%
<a href="#"><i>Gentiana andrewsii</i></a>	<a href="#">Fringe-top Bottle Gentian</a>	14.88%
<a href="#"><i>Lobelia siphilitica</i></a>	<a href="#">Great Blue Lobelia</a>	2.26%
<a href="#"><i>Penstemon digitalis</i></a>	<a href="#">Foxglove Beardtongue</a>	17.59%
<a href="#"><i>Pycnanthemum virginianum</i></a>	<a href="#">Mountain Mint</a>	17.10%
<a href="#"><i>Rudbeckia fulgida</i></a>	<a href="#">Showy Black-eyed Susan</a>	2.84%
<a href="#"><i>Rudbeckia hirta</i></a>	<a href="#">Black-eyed Susan</a>	23.24%
<a href="#"><i>Tradescantia ohiensis</i></a>	<a href="#">Ohio Spiderwort</a>	0.88%
<a href="#"><i>Verbena stricta</i></a>	<a href="#">Hoary Vervain</a>	2.92%
<a href="#"><i>Zizia aurea</i></a>	<a href="#">Golden Alexanders</a>	1.01%
<b>Total</b>		<b>100.00%</b>
<b>Temporary Cover Grasses</b>		
<i>Agrostis alba</i>	Redtop	72.55%
<i>Avena sativa</i>	Seed Oats	6.05%
<i>Lolium multiflorum</i>	Annual Rye Grass	21.40
<b>Total</b>		<b>100.00%</b>

2) **Short Grass Prairie Erosion Control Seed Mix (DP-4)**

Approximate mix weight 87 lb/acre with 107 native seeds/sq. ft.  
66.6% Grasses/Sedges/Rushes; 33.4% Forbs

Scientific Name	Common Name	Percent of Mix Category
<b>Grasses, Sedges, and Rushes</b>		
<a href="#"><i>Bouteloua curtipendula</i></a>	<a href="#">Side Oats Grama</a>	14.83%
<a href="#"><i>Carex bicknellii</i></a>	<a href="#">Bicknell's Sedge</a>	1.52%
<a href="#"><i>Elymus virginicus</i></a>	<a href="#">Virginia Wild Rye</a>	17.54%
<a href="#"><i>Schizachyrium scoparium</i></a>	<a href="#">Little Bluestem</a>	66.11%
<b>Total</b>		<b>100.00%</b>
<b>Forbs</b>		
<a href="#"><i>Asclepias syriaca</i></a>	<a href="#">Common Milkweed</a>	0.51%
<a href="#"><i>Coreopsis lanceolata</i></a>	<a href="#">Sand Coreopsis</a>	15.41%
<a href="#"><i>Echinacea purpurea</i></a>	<a href="#">Purple Coneflower</a>	2.67%
<a href="#"><i>Penstemon digitalis</i></a>	<a href="#">Foxglove Beard Tongue</a>	10.99%
<a href="#"><i>Rudbeckia hirta</i></a>	<a href="#">Black-eyed Susan</a>	43.36%
<a href="#"><i>Solidago nemoralis</i></a>	<a href="#">Gray Goldenrod</a>	9.02%
<a href="#"><i>Verbena stricta</i></a>	<a href="#">Hoary Vervain</a>	16.34%
<a href="#"><i>Zizia aurea</i></a>	<a href="#">Golden Alexanders</a>	1.70%
<b>Total</b>		<b>100.00%</b>
<b>Temporary Cover Grasses</b>		
<i>Agrostis alba</i>	Red Top	72.55%
<i>Avena sativa</i>	Seed Oats	6.05%
<i>Lolium multiflorum</i>	Annual Rye Grass	21.40%
<b>Total</b>		<b>100.00%</b>

3) **"No-Mow" Lawn Mix**  
**Prairie Nursery**  
P.O. Box 306  
Westfield, WI 53964  
Ph: (800) 476-9453  
Fax: (608) 296-2741  
E-mail: [cs@prairienursery.com](mailto:cs@prairienursery.com)  
[www.prairienursery.com](http://www.prairienursery.com)



4) **"Type-A" Seed Mixture (Repair of Turf Grass Lawn Areas)**

- 25 % Famous Kentucky Bluegrass
- 25% Baron Kentucky Bluegrass
- 20% Secretariat Perennial Ryegrass
- 30% Boreal Creeping Red Fescue

- C. Weed seed content shall not exceed 0.25 percent for any variety of seed mixture.
- D. Seed shall be mixed by the dealer. Furnish dealer's guaranteed statement of composition, mixture and percentages of purity, and germination of each variety.

PART 3. **EXECUTION**

3.01 **SEEDBED PREPARATION**

- A. Within all disturbed Project Areas, the surface of the topsoil shall be rough graded and prepared for seeding by removing rocks and debris larger than 2-inch diameter. All windrows shall be eliminated. Hand raking shall be performed around all structures to form smooth transitions.

3.02 **SEEDING & FERTILIZING**

- A. Contractor shall broadcast seed all topsoiled restoration areas at the rates recommended by the seed supplier for each type of native seed mix specified.
- B. Seed shall be applied to all Repair Areas at the approximate rates shown below. The Contractor shall submit a certified list of the actual seed percentages used in the Repair Areas.

3.03 **MULCHING & EROSION CONTROLS**

- A. On the Project Areas receiving native seed mixes, the Contractor shall furnish and install mulch blankets at the locations and to the limits shown on the construction drawings. The mulch blanket shall be North American Green DS75 Straw Blankets. The Contractor shall install and anchor the mulch blankets with wood or metal stakes in accordance with the manufacturer's recommendations. Mechanical anchoring shall be performed in a manner that creates ridges perpendicular to flow of water. Where blankets are used in flow areas, the upstream end of each section shall be buried in a trench to a minimum depth of 6 inches. The Contractor shall water the mulch blanket areas at a rate of approximately 2,000 gallons per acre. Water may be obtained from the onsite creek.
- B. Shredded straw mulch shall be applied at a rate of 2 tons per acre on the adjacent disturbed general lawn areas and spoils fill areas. Shredded straw mulch shall only be applied when wind speeds are 5 mph or less, except if approved otherwise by the Owner. The shredded straw mulch shall be anchored with a sharp-edged "crimping tool". The crimping tool shall be capable of partially cutting, embedding and anchoring the straw so it will not be blown away. The entire surface of the mulched Project shall receive two passes of the crimping tool. The second pass shall be 90 degrees to the first, unless approved otherwise by the Owner.
- C. All soil erosion control products, including (but not limited to) silt fence, erosion control blankets, mulch netting, biostake anchoring pins, non-woven geotextile fabric, and coir logs shall be purchased from the following supplier:

**Hanes Geo Components**  
 Contact: Mark Cavanaugh  
 425 36<sup>th</sup> Street SW  
 Wyoming, MI 49548  
 Ph: (616) 530-8230  
 Fx: (616) 530-2317  
 Email: [mark.cavanaugh@hanescompanies.com](mailto:mark.cavanaugh@hanescompanies.com)

- D. Minimum Erosion Control Products (as specified on the drawings).
  - 1. Straw Single Net Erosion Blankets (100% biodegradable).
  - 2. TerraTex HPG-44 Geotextile Fabric
  - 3. Ecolofence 24" Silt Fence
- E. Additional erosion control measures shall be implemented as required to minimize silt or sediment leaving the construction site. The Contractor shall monitor and maintain all erosion control devices throughout the duration of the construction period.
- F. All temporary erosion control devices should be in place prior to the start of construction/excavation activities, to the extent possible. The Contractor shall remove all temporary erosion control devices once full vegetation has been established.

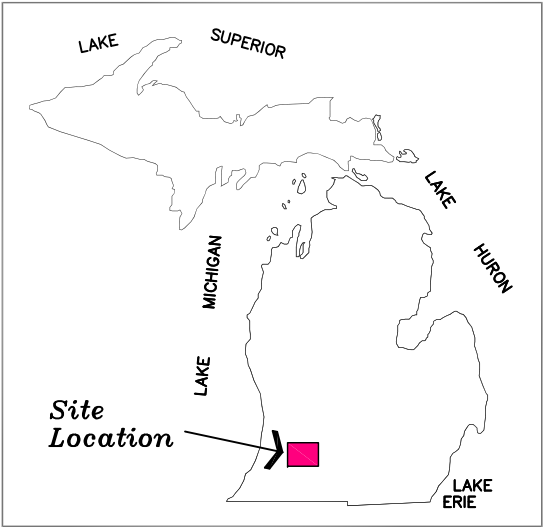
3.04 **MAINTENANCE**

- A. Maintenance responsibilities begin immediately upon completion of seeding and planting, and shall continue for a period of 1-year. All wind, water, fire, vandalism, or natural damage that occurs during this time frame shall be repaired by the Contractor within 5 days of being notified by EQM at no additional cost to the project. Repairs shall be completed in a manner that meets the requirements of these specifications.
- 3.05 **GUARANTEE**
  - A. It is the responsibility of the Contractor to establish and maintain a dense growth of vegetation, for a period of 1-year. All trees and shrubs shall be provided with a minimum 1-year warrantee. Institute measures to protect completed landscape areas. Any part of the area that fails to show a uniform germination shall be re-seeded and such re-seeding shall continue until a dense growth is established. The Contractor shall repair damage to seeded areas resulting from erosion and/or overwatering.
  - B. Replace dead or unhealthy plants with plants of the same size and species as specified. Species substitutions will not be allowed without engineer approval.

**END OF SPECIFICATIONS**

EQM CONTACT  
Environmental Quality Management  
18000 Carillon Boulevard  
Cincinnati, OH 45240  
(513)-265-8875  
Mr. Eric Bowman

CONSULTANT CONTACT  
KIESER & ASSOCIATES, LLC  
536 E. Mich. Ave, Ste 300  
Kalamazoo, MI 49007  
(269) 344-7117  
Mr. Brian Boyer, P.E.



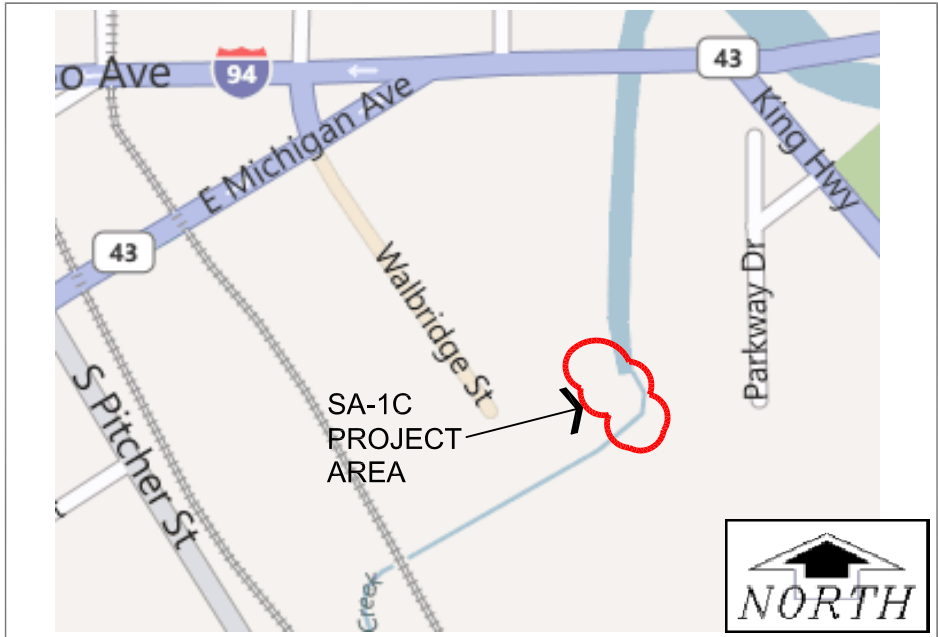
KALAMAZOO COUNTY, MICHIGAN



# PORTAGE CREEK TIME CRITICAL REMOVAL ACTION KALAMAZOO, MICHIGAN

EQM PROJECT NUMBER 030281.0087

PORTAGE CREEK - SITE SA-1C



SITE LOCATION MAP

## INDEX OF DRAWING SHEETS

- |     |                            |
|-----|----------------------------|
| 1   | Cover Sheet                |
| 2   | Site SA-1C Vegetation Plan |
| 3   | Detail Drawings            |
| 4-6 | Specifications             |

## EROSION CONTROLS

1. ALL CONSTRUCTION SHALL COMPLY WITH THE SOIL EROSION AND SEDIMENTATION CONTROL ACT (P.A. 347 OF 1972, AS AMENDED).
2. ALL TEMPORARY EROSION CONTROLS SHALL BE REMOVED ONCE CONSTRUCTION IS COMPLETE.
3. TEMPORARY EROSION CONTROL MEASURES SHALL BE INSTALLED PRIOR TO COMMENCING WORK, TO THE EXTENT POSSIBLE.
4. CONTRACTOR TO PROTECT ONSITE CATCH BASINS FROM DAMAGE AND SEDIMENTATION.
5. ENSURE PROPER DRAINAGE FOLLOWING BACKFILL.
6. CONTRACTOR SHALL MONITOR AND MAINTAIN ALL SOIL EROSION CONTROL MEASURES FOR THE DURATION OF THE CONSTRUCTION PERIOD.
7. SUPPLEMENTAL SOIL EROSION CONTROLS SHALL BE INSTALLED AS NEEDED TO ENSURE

## GENERAL NOTES:

1. The Contractor is responsible for contacting MISS DIG (1-800-482-7171) at least 3 working days before construction begins. The Contractor shall provide the MISS DIG ticket number upon request. Any utility conflicts must be presented to the Engineer in writing prior to commencement of work.
2. With EPA oversight, Contractor is not required to obtain permits for re-vegetation work.
3. The Contractor is responsible for knowing and following all appropriate safety standards which are required by the Michigan Occupational Safety and Health Act.
4. Hard hats must be worn by anyone on the site who may be exposed to falling objects or flying debris and anyone within the operating range of overhead construction equipment. This equipment includes, but is not limited to, backhoes, cranes, draglines, and front end loaders.
5. Any deviation from these construction drawings and specifications will be considered defective work, subject to modification for conformance at the Contractor's expense.
6. Contractor shall keep disturbance of all areas of construction to a minimum.
7. Locations and elevations of existing utilities are not exact. Contact Miss Dig at 1-800-482-7171, prior to beginning construction.
8. Existing utilities destroyed or disturbed by the Contractor's operations shall be repaired at the Contractor's expense.
9. Hand dig in all areas of existing utilities.
10. The contractor shall be required to prevent movement of soil off site. Additional silt fencing may be required beyond that already on-site. Any additional silt fencing shall be incidental to work.
11. All work shall be checked for accuracy to the plans by the Contractor prior to installation.

CITY OF KALAMAZOO  
<http://www.kalamazoo.org/onlinegis/CXviewer.htm>  
T2s R11w, SE 1/4 of Section 22  
in Kalamazoo County, Michigan.

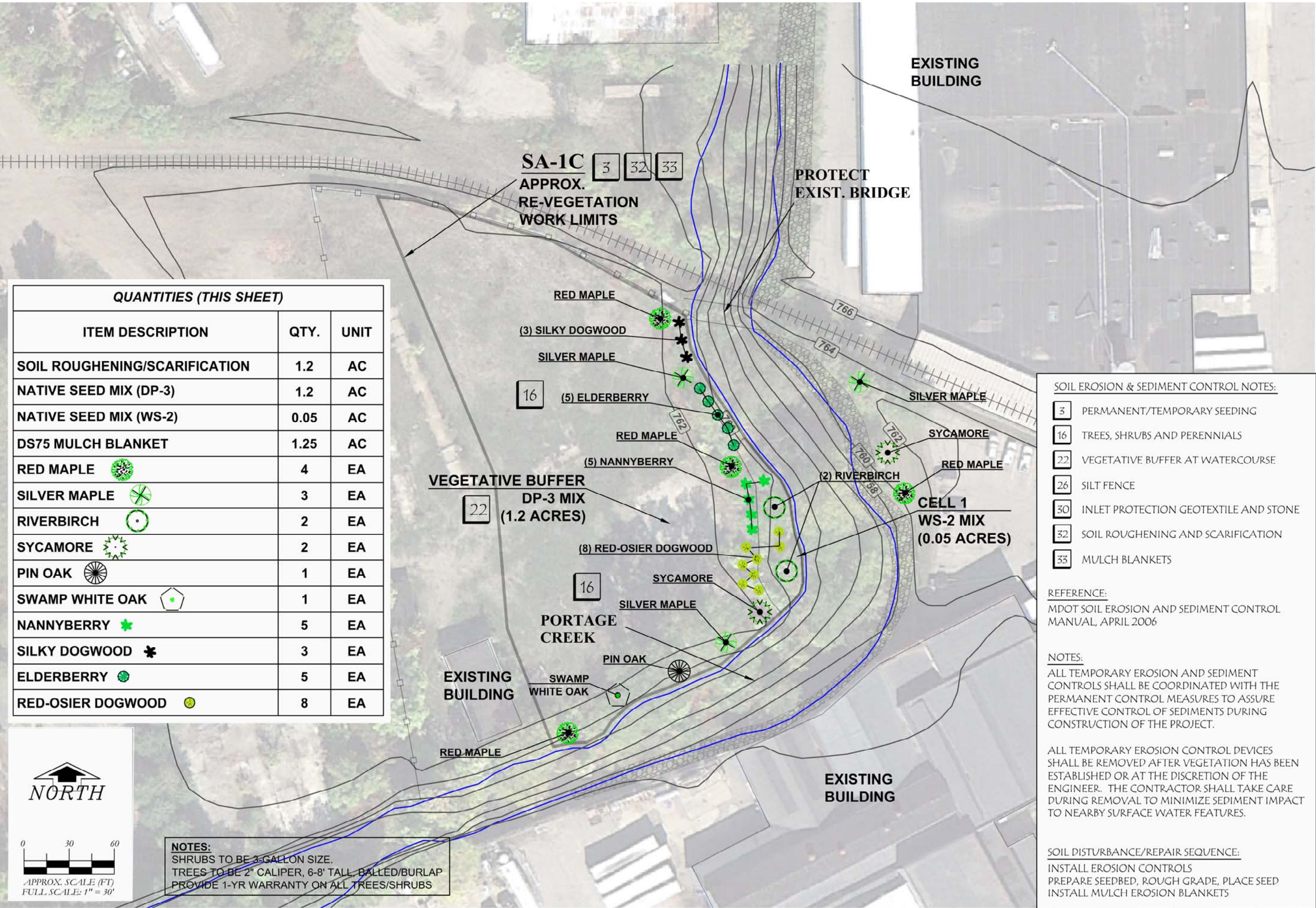


Know what's below.  
Call before you dig.  
1-800-482-7171

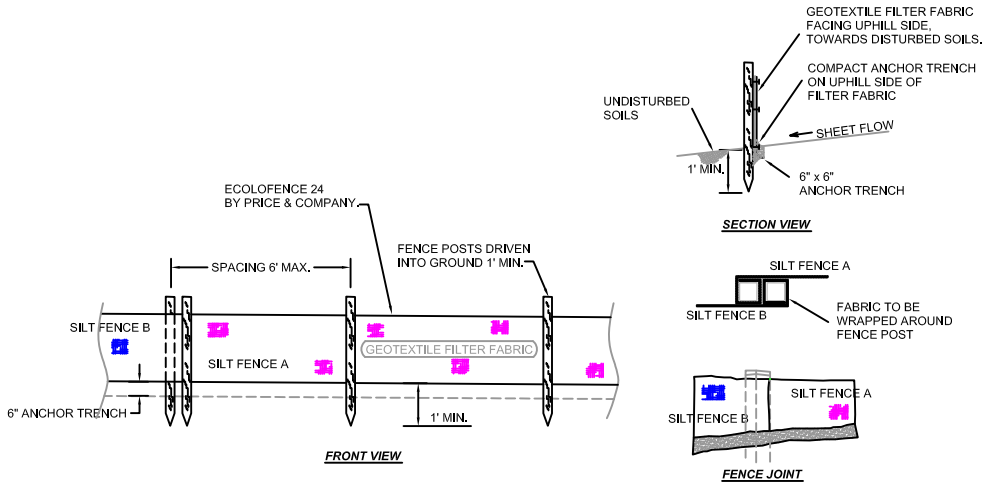
NOTES:  
ALL EXISTING UTILITY LOCATIONS DEPICTED ON THESE PLANS ARE APPROXIMATE; BASED ON AVAILABLE INFORMATION AND FIELD OBSERVATIONS BY OTHERS. AS A RESULT, UTILITY LOCATIONS SHOWN ARE NOT EXACT. DO NOT ASSUME THESE ARE THE ONLY UTILITIES PRESENT.

NOTE TO CONTRACTOR:  
3 FULL WORKING DAYS BEFORE YOU DIG, CALL "MISS DIG".

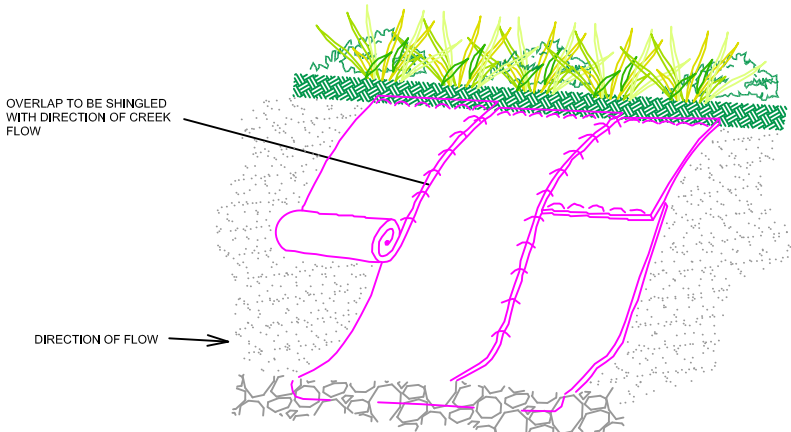






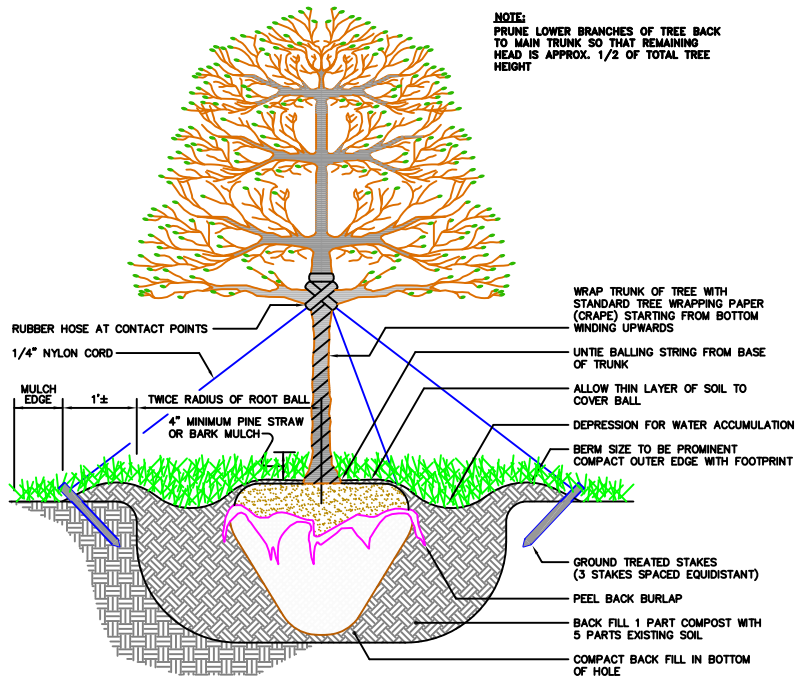


1 SOIL EROSION CONTROL  
GEOTEXTILE SILT FENCE  
NO SCALE

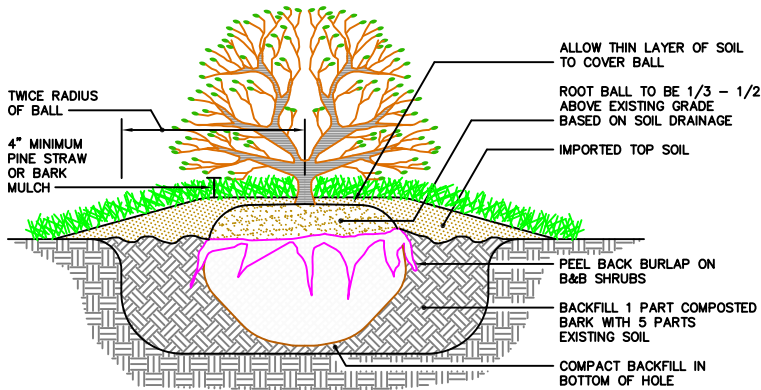


2 EROSION CONTROL BLANKET DETAIL  
NO SCALE

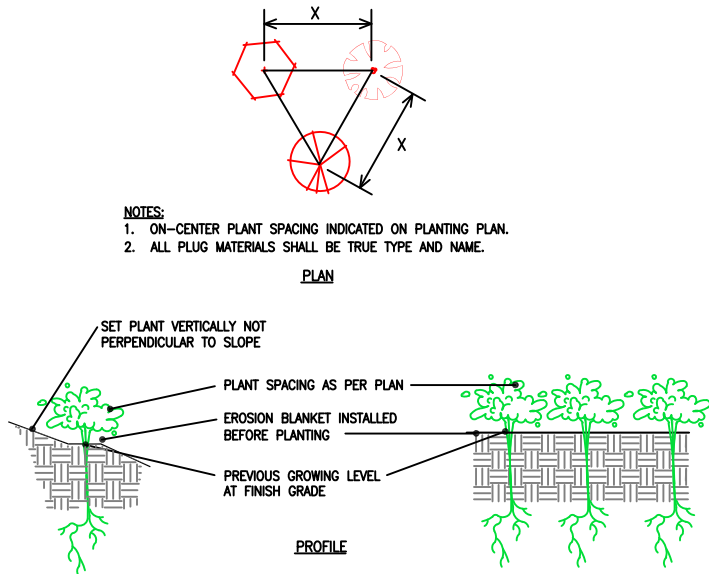
- NOTES:**
1. PREPARE SOIL BEFORE INSTALLING BLANKETS, INCLUDING APPLICATION OF SEED.
  2. BEGIN AT THE TOP OF THE SLOPE BY ANCHORING THE BLANKET IN A 6" DEEP BY 6" WIDE TRENCH. BACKFILL AND COMPACT THE TRENCH AFTER PINNING.
  3. ROLL THE BLANKETS DOWN THE SLOPE IN THE DIRECTION OF THE WATER FLOW.
  4. THE EDGES OF PARALLEL BLANKETS MUST BE PINNED WITH APPROXIMATELY 2" OVERLAP.
  5. WHEN BLANKETS MUST BE SPICED DOWN THE SLOPE, PLACE BLANKETS END OVER END (SHINGLE STYLE) WITH APPROXIMATELY 6" OVERLAP. STAPLE THROUGH OVERLAPPED AREA, APPROXIMATELY 12" APART.
  6. BLANKETS SHALL BE PINNED IN ROWS NOT MORE THAN 2 FT O.C. WITH A MAXIMUM OF 20" BETWEEN PINS, 3.5 PINS PER SQ YD.
  7. LOWER END OF BLANKET TO BE TUCKED 6" MIN. BELOW EDGE OF TOE.



3 STAKING AND PLANTING  
TREE DETAIL  
NO SCALE



4 SHRUB DETAIL  
CONTAINER AND B&B  
NO SCALE



5 PLANTING  
GROUND COVER - NO SCALE



**SA-1C VEGETATION**

**PART 1.      GENERAL**

**1.01    SECTION INCLUDES**

- A.    Preparation of grades to receive seeding and vegetation.
- B.    Seeding.
- C.    Seed protection on slopes.
- D.    Planting special seed mixes.
  - 1.    **DP-3** (Short Stature Prairie Seed Mix)
  - 2.    **WS-2** (Riparian Mix)
- E.    Maintenance and Warranty.

**1.02    SUBMITTALS**

- A.    Documentation must include the following:
  - 1.    Submit seed tags to Engineer prior to seeding.
  - 2.    Submit copy of invoice to media amendment.

**1.03    QUALITY ASSURANCE**

- A.    Grass seed shall meet the tolerance for germination and purity of the Official Seed Analyses of North America.

**1.04    PRODUCT DELIVERY, STORAGE, AND HANDLING**

- A.    Deliver seed in original containers showing analysis of seed mixture, percentage of pure seed, year of production, net weight, date of testing, and location of packaging. Damaged packages are not acceptable.

**1.05    EXISTING CONDITIONS**

- A.    Beginning work means acceptance of existing conditions.

**PART 2.      PRODUCTS**

**2.01    GROWING MEDIA**

- A.    Topsoil
  - 1.    Existing topsoil shall be re-used.
  - 2.    Import additional topsoil as needed to minimize weed seed viability.
- B.    Water
  - 1.    To be furnished by the Contractor. Portage Creek is an acceptable source.

**2.02    SEED**

- A.    Seed shall be new crop, cleaned, and comprising of the following varieties mixed in proportion by weight shown and testing the minimum percentages and germination indicated as follows:

**2.03    SEED MIXTURE**

- A.    All special native seed mixes shall be purchased from the following supplier:

**1) Heartland Restoration Services, Inc.**      **Contact: Eric Ummel**  
14921 Hand Road  
Fort Wayne, Indiana 46818  
Ph: (260) 489-8511  
Fx: (260) 489-8607  
Email: mail@earthsourceinc.net

Trees, shrubs and plugs (refer to tree/shrub schedule on the drawings) shall be purchased from the following supplier(s) to the extent possible (as current stock allows):

**2) Wildtype Native Plant Nursery**      **Contact: Bill Schneider**  
900 N. Every Road  
Mason, MI 48854  
Ph: (517) 244-1140  
Fax: (517) 244-1142  
E-mail: [wildtype@msu.edu](mailto:wildtype@msu.edu)

**3) Hidden Savanna Nursery**      **Contact: Chad Hughson**  
18 N Van Kal Street  
Kalamazoo, MI 49009  
Ph: (269)352-3876  
Email: [info@hiddensavanna.com](mailto:info@hiddensavanna.com)

**4) American Roots**      **Contact: Trish Hacker-Henning**  
1958 Hidden Lake Trail  
Ortonville, MI 48462  
Ph: (248) 627-8525 or (248) 882-7768  
Fax: (248) 627-3865  
Email: [americanrootsnat@aol.com](mailto:americanrootsnat@aol.com)

**5) Sandhill Farm**      **Contact: Cheryl Tolley**  
11250 10 Mile Road  
Rockford, MI 49341-7954  
Ph: (616) 691-8214  
Fax: (616) 691-7872  
Email: [cherylt@iserv.net](mailto:cherylt@iserv.net)

**6) Native Landscapes**      **Contact: Randy Counterman**  
28092 M-40 Hwy.  
Paw Paw, MI 49079  
Phone: 269-929-3455  
Email: [randy.counterman@gmail.com](mailto:randy.counterman@gmail.com)

B. Special Native Seed Mixes

1) **Midwestern Short Stature Prairie Seed Mix (DP-3)**

Approximate mix weight 43 lb/acre with 74 native seeds/sq.ft.  
44.4% Grasses/Sedges/Rushes; 44.1% Forbs; 11.4% Temporary Cover Grasses

Scientific Name	Common Name
<i>Grasses, Sedges, and Rushes</i>	
Bouteloua curtipendula	Side Oats Grama
Carex bicknellii	Bicknell's Sedge
Elymus virginicus	Virginia Wild Rye
Schizachyrium scoparium	Little Bluestem
Sporobolus heterolepis	Prairie Dropseed
<i>Forbs</i>	
Asclepias syriaca	Common Milkweed
Asclepias tuberosa	Butterfly Milkweed
Aster ericoides	White Heath Aster
Coreopsis lanceolata	Sand Coreopsis
Coreopsis palmata	Prairie Coreopsis
Echinacea purpurea	Purple Coneflower
Gentiana andrewsii	Fringe-top Bottle Gentian
Helianthus occidentalis	Few-leaf Sunflower
Lespedeza capitata	Round-headed Bushclover
Liatris aspera	Rough Blazingstar
Liatris scariosa nieuwlandii	Savanna Blazingstar
Lupinus perennis	Wild Blue Lupine
Parthenium integrifolium	Wild Quinine
Penstemon digitalis	Foxglove Beard Tongue
Petalostemum purpureum	Purple Prairie Clover
Potentilla arguta	Tall Cinquefoil
Pycnanthemum virginianum	Mountain Mint
Rudbeckia fulgida	Showy Black-eyed Susan
Rudbeckia hirta	Black-eyed Susan
Solidago nemoralis	Gray Goldenrod
Tradescantia ohiensis	Ohio Spiderwort
Verbena stricta	Hoary Vervain
Zizia aurea	Golden Alexanders
<i>Temporary Cover Grasses</i>	
Avena sativa	Seed Oats

2) **Midwestern Riparian Seed Mix (WS-2)**

Approximate mix weight 73 lb/acre with 46 native seeds/sq. ft.  
13.9% Grasses/Sedges/Rushes; 5.4% Forbs; 80.7% Temporary Cover Grasses

**\*SPECIAL NOTES:** Please incorporate *Carex stricta* and *Carex bebbii* into seed mix.  
Substitute Giant St. John's Wort (*Hypericum ascron*) for Wingstem (*Verbesina alternifolia*).

Scientific Name	Common Name
<i>Grasses, Sedges, and Rushes</i>	
Carex frankii	Frank's Sedge
Carex muskingumensis	Palm Sedge
Carex normalis	Spreading Oval Sedge
Carex squarrosa	Squarrose Sedge
Carex vulpinoidea	Fox Sedge
Cinna arundinacea	Common Wood Reed
Elymus canadensis	Canada Wild Rye
Elymus riparius	Riverbank Wild Rye
Elymus virginicus	Virginia Wild Rye
Glyceria striata	Fowl Manna Grass
Leersia oryzoides	Rice Cut Grass
Panicum virgatum	Switch Grass
Scirpus atrovirens	Dark Green Bulrush
Scirpus pendulus	Drooping Bulrush
<i>Forbs</i>	
Aster novae-angliae	New England Aster
Bidens cernua	Nodding Bur Marigold
Eupatorium purpureum	Purple Joe Pye Weed
Eupatorium rugosum	White Snakeroot
Heliopsis helianthoides	False Sunflower
Lysimachia ciliata	Fringed Loosestrife
Rudbeckia laciniata	Green-headed Coneflower
Rudbeckia triloba	Brown-eyed Susan
Silphium perfoliatum	Cup Plant
<del>Verbesina alternifolia</del>	<del>Wingstem (substitute Giant St. John's Wort)</del>
Vernonia gigantea	Tall Ironweed
Zizia aurea	Golden Alexanders
<i>Temporary Cover Grasses</i>	
Agrostis alba	Redtop
Agrostis alba palustris	Creeping Bent Grass
Avena sativa	Seed Oats
Lolium multiflorum	Annual Rye Grass



- C. Weed seed content shall not exceed 0.25 percent for any variety of seed mixture.
- D. Seed shall be mixed by the dealer. Furnish dealer's guaranteed statement of composition, mixture and percentages of purity, and germination of each variety.

PART 3.        EXECUTION

3.01    SEEDBED PREPARATION

- A. Within all disturbed Project Areas, the surface of the topsoil shall be rough graded and prepared for seeding by removing rocks and debris larger than 2-inch diameter. All windrows shall be eliminated. Hand raking shall be performed around all structures to form smooth transitions.

3.02    SEEDING & FERTILIZING

- A. Contractor shall broadcast seed all topsoiled restoration areas at the rates recommended by the seed supplier for each type of native seed mix specified.
- B. Seed shall be applied to all Repair Areas at the approximate rates shown below. The Contractor shall submit a certified list of the actual seed percentages used in the Repair Areas.

3.03    MULCHING & EROSION CONTROLS

- A. On the Project Areas receiving native seed mixes, the Contractor shall furnish and install mulch blankets at the locations and to the limits shown on the construction drawings. The mulch blanket shall be North American Green DS75 Straw Blankets. The Contractor shall install and anchor the mulch blankets with wood or metal stakes in accordance with the manufacturer's recommendations. Mechanical anchoring shall be performed in a manner that creates ridges perpendicular to flow of water. Where blankets are used in flow areas, the upstream end of each section shall be buried in a trench to a minimum depth of 6 inches. The Contractor shall water the mulch blanket areas at a rate of approximately 2,000 gallons per acre. Water may be obtained from the onsite creek.
- B. Shredded straw mulch shall be applied at a rate of 2 tons per acre on the adjacent disturbed general lawn areas and spoils fill areas. Shredded straw mulch shall only be applied when wind speeds are 5 mph or less, except if approved otherwise by the Owner. The shredded straw mulch shall be anchored with a sharp-edged "crimping tool". The crimping tool shall be capable of partially cutting, embedding and anchoring the straw so it will not be blown away. The entire surface of the mulched Project shall receive two passes of the crimping tool. The second pass shall be 90 degrees to the first, unless approved otherwise by the Owner.
- C. All soil erosion control products, including (but not limited to) silt fence, erosion control blankets, mulch netting, biostake anchoring pins, non-woven geotextile fabric, and coir logs shall be purchased from the following supplier:

**Hanes Geo Components**  
425 36<sup>th</sup> Street SW  
Wyoming, MI 49548  
Ph: (616) 530-8230  
Fx: (616) 530-2317

**Contact:** Mark Cavanaugh

- D. Minimum Erosion Control Products (as specified on the drawings).
  - 1. Straw Single Net Erosion Blankets (100% biodegradable).
  - 2. TerraTex HPG-44 Geotextile Fabric
  - 3. Ecolofence 24" Silt Fence

- E. Additional erosion control measures shall be implemented as required to minimize silt or sediment leaving the construction site. The Contractor shall monitor and maintain all erosion control devices throughout the duration of the construction period.

- F. All temporary erosion control devices should be in place prior to the start of construction/excavation activities, to the extent possible. The Contractor shall remove all temporary erosion control devices once full vegetation has been established.

3.04    MAINTENANCE

- A. Maintenance responsibilities begin immediately upon completion of seeding and planting, and shall continue for a period of 1-year. All wind, water, fire, vandalism, or natural damage that occurs during this time frame shall be repaired by the Contractor within 5 days of being notified by EQM at no additional cost to the project. Repairs shall be completed in a manner that meets the requirements of these specifications.

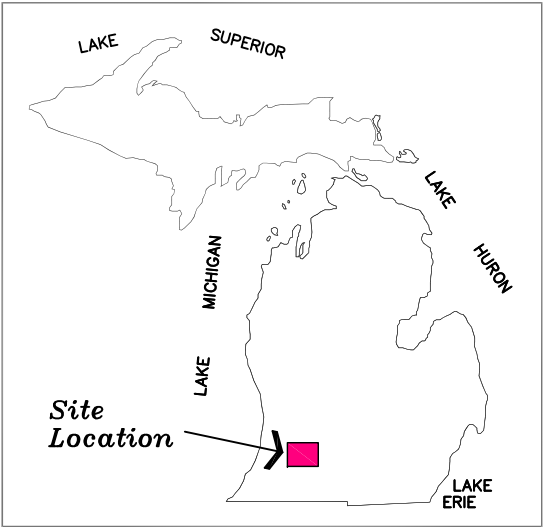
3.05    GUARANTEE

- A. It is the responsibility of the Contractor to establish and maintain a dense growth of vegetation, for a period of 1-year. All trees and shrubs shall be provided with a minimum 1-year warrantee. Institute measures to protect completed landscape areas. Any part of the area that fails to show a uniform germination shall be re-seeded and such re-seeding shall continue until a dense growth is established. The Contractor shall repair damage to seeded areas resulting from erosion and/or overwatering.
- B. Replace dead or unhealthy plants with plants of the same size and species as specified. Species substitutions will not be allowed without engineer approval.

**END OF SPECIFICATIONS**

EQM CONTACT  
Environmental Quality Management  
18000 Carillon Boulevard  
Cincinnati, OH 45240  
(513)-265-8875  
Mr. Eric Bowman

CONSULTANT CONTACT  
KIESER & ASSOCIATES, LLC  
536 E. Mich. Ave, Ste 300  
Kalamazoo, MI 49007  
(269) 344-7117  
Mr. Brian Boyer, P.E.



KALAMAZOO COUNTY, MICHIGAN



# PORTAGE CREEK TIME CRITICAL REMOVAL ACTION KALAMAZOO, MICHIGAN

EQM PROJECT NUMBER 030281.0087

PORTAGE CREEK - SITE SA-5A



SITE LOCATION MAP

### INDEX OF DRAWING SHEETS

- 1 Cover Sheet
- 2 Site SA-5A Vegetation Plan
- 3 Detail Drawings
- 4-6 Specifications

### EROSION CONTROLS

1. ALL CONSTRUCTION SHALL COMPLY WITH THE SOIL EROSION AND SEDIMENTATION CONTROL ACT (P.A. 347 OF 1972, AS AMENDED).
2. ALL TEMPORARY EROSION CONTROLS SHALL BE REMOVED ONCE CONSTRUCTION IS COMPLETE.
3. TEMPORARY EROSION CONTROL MEASURES SHALL BE INSTALLED PRIOR TO COMMENCING WORK, TO THE EXTENT POSSIBLE.
4. CONTRACTOR TO PROTECT ONSITE CATCH BASINS FROM DAMAGE AND SEDIMENTATION.
5. ENSURE PROPER DRAINAGE FOLLOWING BACKFILL.
6. CONTRACTOR SHALL MONITOR AND MAINTAIN ALL SOIL EROSION CONTROL MEASURES FOR THE DURATION OF THE CONSTRUCTION PERIOD.
7. SUPPLEMENTAL SOIL EROSION CONTROLS SHALL BE INSTALLED AS NEEDED TO ENSURE

### GENERAL NOTES:

1. The Contractor is responsible for contacting MISS DIG (1-800-482-7171) at least 3 working days before construction begins. The Contractor shall provide the MISS DIG ticket number upon request. Any utility conflicts must be presented to the Engineer in writing prior to commencement of work.
2. No permitting is required for conducting re-vegetation work.
3. The Contractor is responsible for knowing and following all appropriate safety standards which are required by the Michigan Occupational Safety and Health Act.
4. Hard hats must be worn by anyone on the site who may be exposed to falling objects or flying debris and anyone within the operating range of overhead construction equipment. This equipment includes, but is not limited to, backhoes, cranes, draglines, and front end loaders.
5. Any deviation from these construction drawings and specifications will be considered defective work, subject to modification for conformance at the Contractor's expense.
6. Contractor shall keep disturbance of all areas of construction to a minimum.
7. Locations and elevations of existing utilities are not exact. Contact Miss Dig at 1-800-482-7171, prior to beginning construction.
8. Existing utilities destroyed or disturbed by the Contractor's operations shall be repaired at the Contractor's expense.
9. Hand dig in all areas of existing utilities.
10. The contractor shall be required to prevent movement of soil off site. Additional silt fencing may be required beyond that already on-site. Any additional silt fencing shall be incidental to work.
11. All work shall be checked for accuracy to the plans by the Contractor prior to installation.

CITY OF KALAMAZOO  
<http://www.kalamazoo.org/onlinegis/CXviewer.htm>  
T2s R11w, SE 1/4 of Section 22  
in Kalamazoo County, Michigan.



Know what's below.  
Call before you dig.  
1-800-482-7171

NOTES:  
ALL EXISTING UTILITY LOCATIONS DEPICTED ON THESE PLANS ARE APPROXIMATE; BASED ON AVAILABLE INFORMATION AND FIELD OBSERVATIONS BY OTHERS. AS A RESULT, UTILITY LOCATIONS SHOWN ARE NOT EXACT. DO NOT ASSUME THESE ARE THE ONLY UTILITIES PRESENT.

NOTE TO CONTRACTOR:  
3 FULL WORKING DAYS BEFORE YOU DIG, CALL "MISS DIG".



Area #1 - Plugs

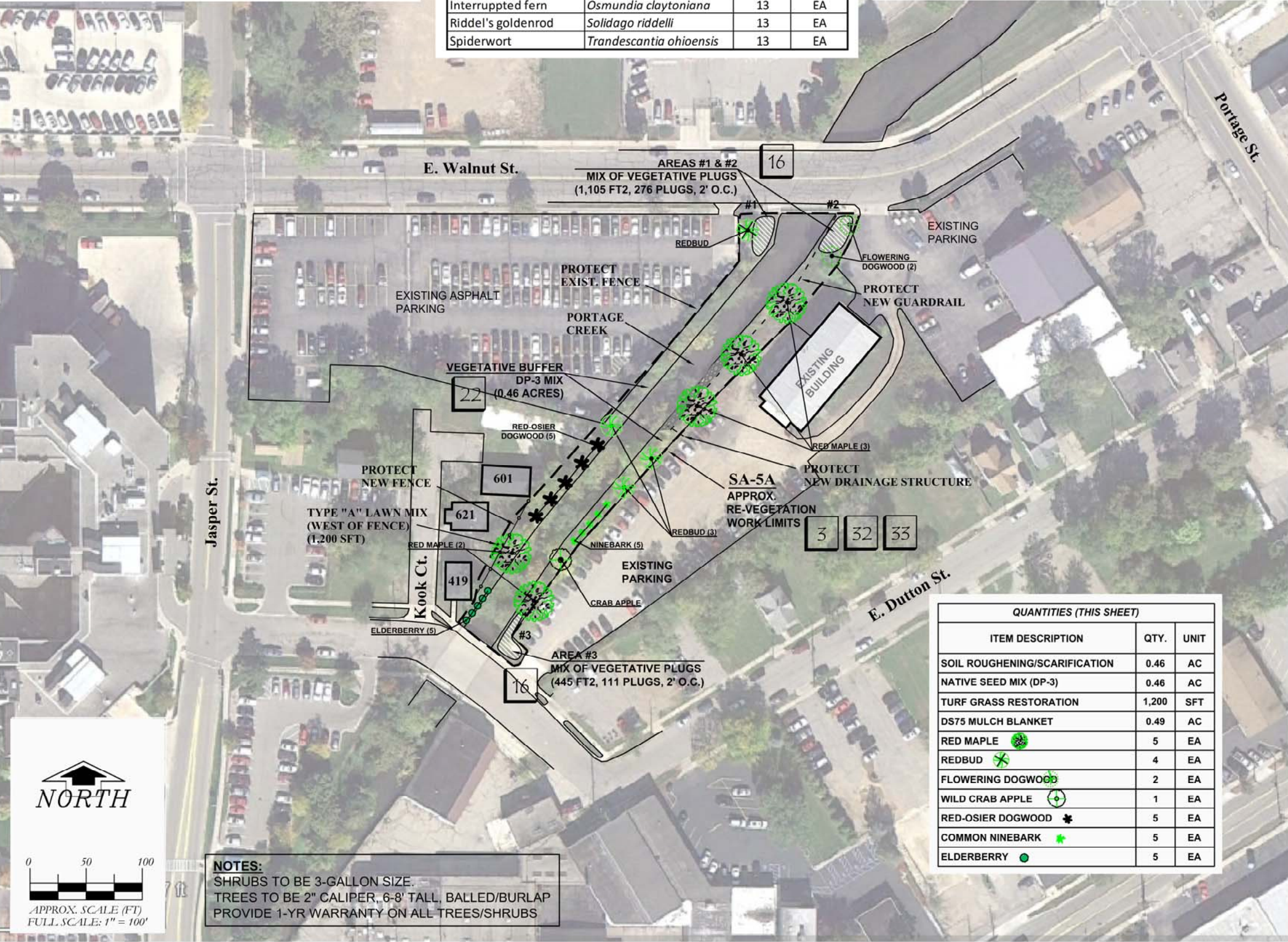
Common Name	Scientific Name	QTY.	UNIT
Knodding pink onion	Allium cercuum	16	EA
Common milkweed	Asclepias syriaca	16	EA
New England aster	Aster novae-angliae	16	EA
Sand coreopsis	Coreopsis lanceolata	16	EA
Purple coneflower	Echinacea purpurea	16	EA
Mad-dog skullcap	Scutellaria lateriflora	16	EA
Riddel's goldenrod	Solidago riddelli	16	EA
Spiderwort	Trandescantia ohioensis	16	EA

Area #2 - Plugs

Common Name	Scientific Name	QTY.	UNIT
Knodding pink onion	Allium cercuum	14	EA
Common milkweed	Asclepias syriaca	14	EA
New England aster	Aster novae-angliae	14	EA
Crooked stem aster	Aster prenanthoides	14	EA
Purple coneflower	Echinacea purpurea	14	EA
Marsh blazingstar	Liatric spicata	13	EA
Great blue lobelia	Lobelia siphilitica	13	EA
Lupine	Lupinus perennis	13	EA
Interrupted fern	Osmundia claytoniana	13	EA
Riddel's goldenrod	Solidago riddelli	13	EA
Spiderwort	Trandescantia ohioensis	13	EA

Area #3 - Plugs

Common Name	Scientific Name	QTY.	UNIT
Knodding pink onion	Allium cercuum	14	EA
Butterfly weed	Asclepias tuberosa	14	
Sand coreopsis	Coreopsis lanceolata	14	EA
Purple coneflower	Echinacea purpurea	14	EA
Great blue lobelia	Lobelia siphilitica	14	EA
Black-eyed susan	Rudbeckia fulgida	14	EA
Spiderwort	Trandescantia ohioensis	14	EA
Blue vervain	Verbena hastata	13	EA



NOTES:  
SHRUBS TO BE 3-GALLON SIZE.  
TREES TO BE 2" CALIPER, 6-8' TALL, BALLED/BURLAP  
PROVIDE 1-YR WARRANTY ON ALL TREES/SHRUBS

SOIL EROSION & SEDIMENT CONTROL NOTES:

- 3 PERMANENT/TEMPORARY SEEDING
- 16 TREES, SHRUBS AND PERENNIALS
- 22 VEGETATIVE BUFFER AT WATERCOURSE
- 26 SILT FENCE
- 30 INLET PROTECTION GEOTEXTILE AND STONE
- 32 SOIL ROUGHENING AND SCARIFICATION
- 33 MULCH BLANKETS

REFERENCE:

MDOT SOIL EROSION AND SEDIMENT CONTROL  
MANUAL, APRIL 2006

NOTES:

ALL TEMPORARY EROSION AND SEDIMENT  
CONTROLS SHALL BE COORDINATED WITH THE  
PERMANENT CONTROL MEASURES TO ASSURE  
EFFECTIVE CONTROL OF SEDIMENTS DURING  
CONSTRUCTION OF THE PROJECT.

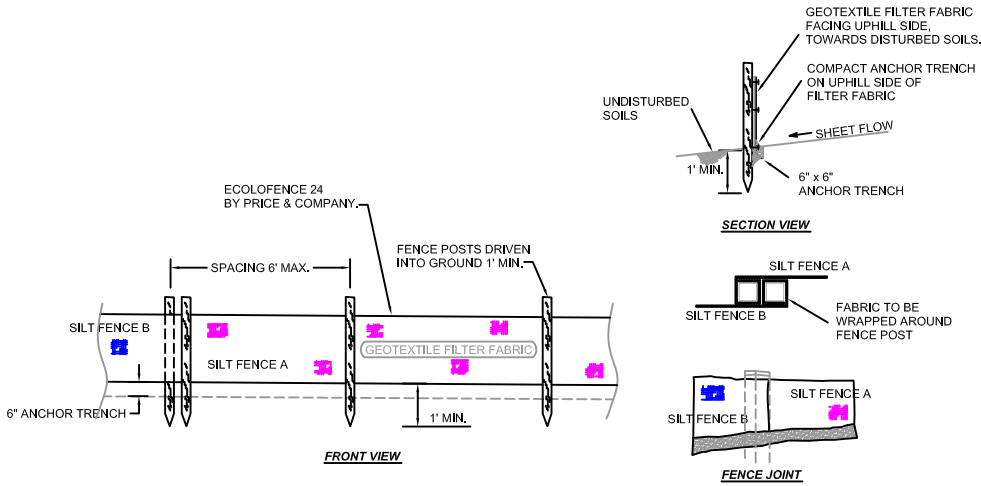
ALL TEMPORARY EROSION CONTROL DEVICES  
SHALL BE REMOVED AFTER VEGETATION HAS BEEN  
ESTABLISHED OR AT THE DISCRETION OF THE  
ENGINEER. THE CONTRACTOR SHALL TAKE CARE  
DURING REMOVAL TO MINIMIZE SEDIMENT IMPACT  
TO NEARBY SURFACE WATER FEATURES.

SOIL DISTURBANCE/REPAIR SEQUENCE:

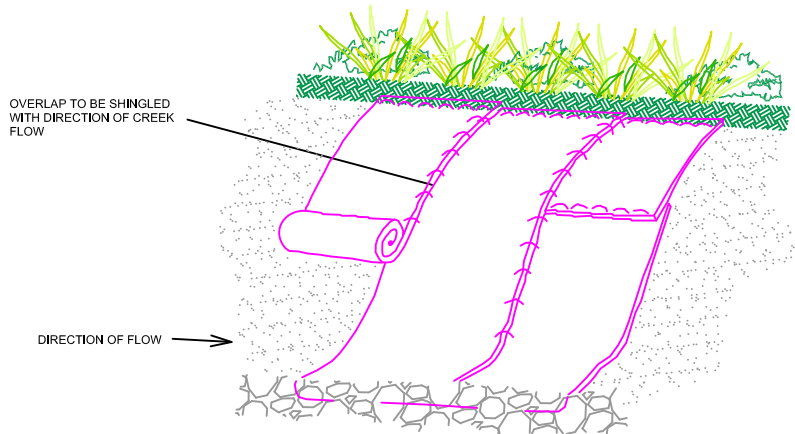
INSTALL EROSION CONTROLS  
PREPARE SEEDBED, FINE GRADE, PLACE SEED  
INSTALL MULCH EROSION BLANKETS

QUANTITIES (THIS SHEET)		
ITEM DESCRIPTION	QTY.	UNIT
SOIL ROUGHENING/SCARIFICATION	0.46	AC
NATIVE SEED MIX (DP-3)	0.46	AC
TURF GRASS RESTORATION	1,200	SFT
DS75 MULCH BLANKET	0.49	AC
RED MAPLE	5	EA
REDBUD	4	EA
FLOWERING DOGWOOD	2	EA
WILD CRAB APPLE	1	EA
RED-OSIER DOGWOOD	5	EA
COMMON NINEBARK	5	EA
ELDERBERRY	5	EA



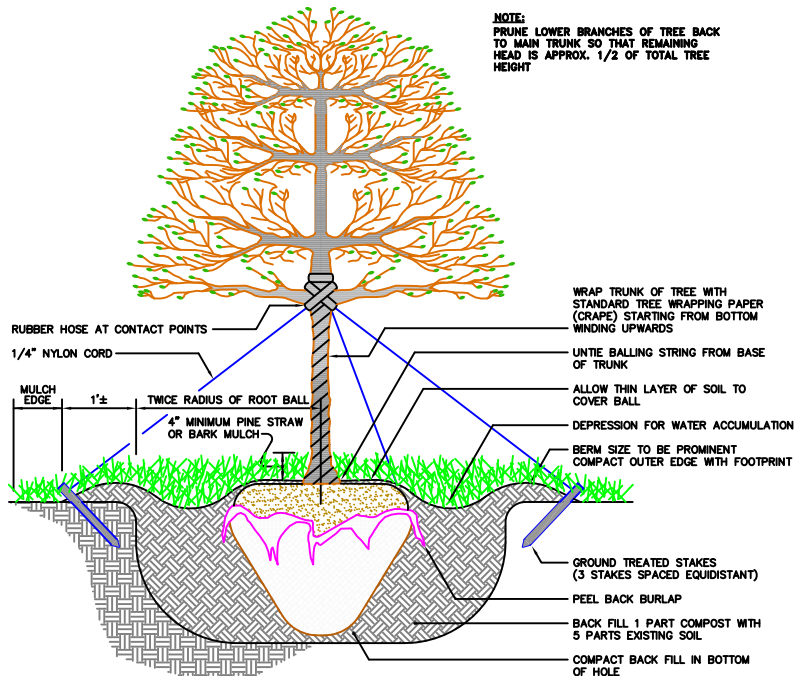


**1**  
**3** SOIL EROSION CONTROL  
GEOTEXTILE SILT FENCE  
NO SCALE

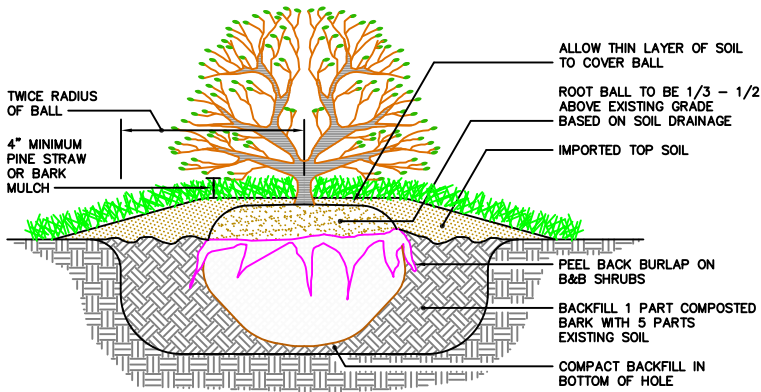


**2**  
**3** EROSION CONTROL BLANKET DETAIL  
NO SCALE

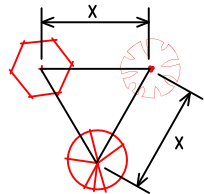
- NOTES:**
1. PREPARE SOIL BEFORE INSTALLING BLANKETS, INCLUDING APPLICATION OF FERTILIZER AND SEED.
  2. BEGIN AT THE TOP OF THE SLOPE BY ANCHORING THE BLANKET IN A 6" DEEP BY 6" WIDE TRENCH. BACKFILL AND COMPACT THE TRENCH AFTER PINNING.
  3. ROLL THE BLANKETS DOWN THE SLOPE IN THE DIRECTION OF THE WATER FLOW.
  4. THE EDGES OF PARALLEL BLANKETS MUST BE PINNED WITH APPROXIMATELY 2" OVERLAP.
  5. WHEN BLANKETS MUST BE SPICED DOWN THE SLOPE, PLACE BLANKETS END OVER END (SHINGLE STYLE) WITH APPROXIMATELY 6" OVERLAP. STAPLE THROUGH OVERLAPPED AREA, APPROXIMATELY 12" APART.
  6. BLANKETS SHALL BE PINNED IN ROWS NOT MORE THAN 2 FT O.C. WITH A MAXIMUM OF 20" BETWEEN PINS, 3.5 PINS PER SQ YD.
  7. LOWER END OF BLANKET TO BE TUCKED 6" MIN. BELOW EDGE OF TOE.



**3**  
**3** STAKING AND PLANTING  
TREE DETAIL  
NO SCALE

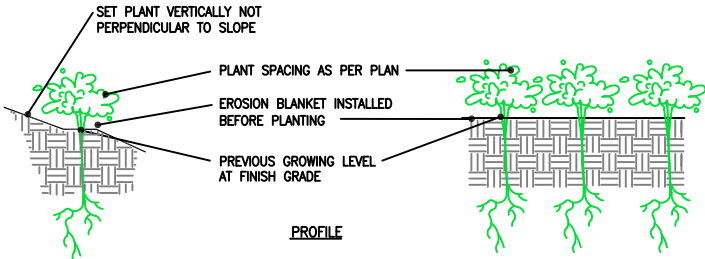


**4**  
**3** SHRUB DETAIL  
CONTAINER AND B&B  
NO SCALE



- NOTES:**
1. ON-CENTER PLANT SPACING INDICATED IN GROUND COVER SCHEDULE (SHEET 9).
  2. ALL PLUG MATERIALS SHALL BE TRUE TYPE AND NAME.

**PLAN**



**5**  
**3** PLANTING  
GROUND COVER - NO SCALE



## SA-5A VEGETATION

**PART 1. GENERAL**

**1.01 SECTION INCLUDES**

- A. Preparation of grades to receive seeding and vegetation.
- B. Seeding and fertilizing.
- C. Seed protection on slopes.
- D. Hydroseeding.
- E. Planting special seed mixes
  - 1. **DP-3** (Midwestern Short Stature Prairie Seed Mix)
- F. Maintenance and Warranty.

## 1.02 SUBMITTALS

- A. Documentation must include the following:**
- 1. Submit seed tags to Engineer prior to seeding.**
  - 2. Submit copy of invoice to media amendment.**

### 1.03 QUALITY ASSURANCE

- A. Grass seed shall meet the tolerance for germination and purity of the Official Seed Analyses of North America.

#### 1.04 PRODUCT DELIVERY, STORAGE, AND HANDLING

- A. Deliver seed in original containers showing analysis of seed mixture, percentage of pure seed, year of production, net weight, date of testing, and location of packaging. Damaged packages are not acceptable.
- B. Deliver fertilizer in waterproof bags showing weight, chemical analysis, and name of manufacturer.

## 1.05 EXISTING CONDITIONS

- A. Beginning work means acceptance of existing conditions.

## PART 2. PRODUCTS

## 2.01 GROWING MEDIA

- A. Topsoil
1. Existing topsoil shall be re-used.
  2. Import additional topsoil as needed.

- B. Water
1. To be furnished by the Contractor. Portage Creek is an acceptable source.

## 2.02 SEED

- A. Seed shall be new crop, cleaned, and comprising of the following varieties mixed in proportion by weight shown and testing the minimum percentages and germination indicated as follows:

### 2.03 SEED MIXTURE

- A. Type "A" Seed Mixture (Repair of General Lawn Areas)

Portage Creek Area Time Critical Removal Action  
EQM Project Number: 030281.0087  
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Page 1

**KIESER & ASSOCIATES, LLC**

- |      |                                |
|------|--------------------------------|
| 25 % | Famous Kentucky Bluegrass      |
| 25%  | Baron Kentucky Bluegrass       |
| 20%  | Secretariat Perennial Ryegrass |
| 30%  | Boreal Creeping Red Fescue     |

- B. All special native seed mixes shall be purchased from the following supplier:  
 1) Heartland Restoration Services, Inc. **Contact:** Eric Ummel

14921 Hand Road  
Fort Wayne, Indiana 46818  
Ph: (260) 489-8511  
Fx: (260) 489-8607  
Email: [mail@earthsourceinc.net](mailto:mail@earthsourceinc.net)

Trees, shrubs and plugs (refer to tree/shrub schedule on the drawings) shall be purchased from the following supplier(s) to the extent possible (as current stock allows):

- 2) Wildtype Native Plant Nursery** **Contact: Bill Schneider**

900 N. Every Road  
Mason, MI 48854  
Ph: (517) 244-1140  
Fax: (517) 244-1142  
E-mail: [wildtype@msu.edu](mailto:wildtype@msu.edu)

- 3) Hidden Savanna Nursery** **Contact:** Chad Hughson

18 N Van Kal Street  
Kalamazoo, MI 49009  
Ph: (269)352-3876  
Email: [info@hiddensavanna.com](mailto:info@hiddensavanna.com)

- 4) American Roots** **Contact:** Trish Hacker-Henning

1958 Hidden Lake Trail  
Ortonville, MI 48462  
Ph: (248) 627-8525 or (248) 882-7768  
Fax: (248) 627-3865  
Email: [americanrootsnat@aol.com](mailto:americanrootsnat@aol.com)

- 5) Sandhill Farm** **Contact:** Cheryl Tolley

11250 10 Mile Road  
Rockford, MI 49341-7954  
Ph: (616) 691-8214  
Fax: (616) 691-7872  
Email: [cheryl@iserv.net](mailto:cheryl@iserv.net)

- 6) Mary Ann's Michigan Trees & Shrubs** **Contact:** Mary Ann Menck

28092 M-40 Hwy.  
Paw Paw, MI 49079  
Phone: (269) 628-2474  
Email: [mamencok@mei.net](mailto:mamencok@mei.net)

Portage Creek Area Time Critical Removal Action  
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Page 2

**KIESER & ASSOCIATES, LLC**

C. Special Native Seed Mixes

1) **Midwestern Short Stature Prairie Seed Mix (DP3)**

Approximate mix weight 43 lb/acre with 74 native seeds/sq.ft.  
44.4% Grasses/Sedges/Rushes; 44.1% Forbs; 11.4% Temporary Cover Grasses

Scientific Name	Common Name
<i>Grasses, Sedges, and Rushes</i>	
Bouteloua curtipendula	Side Oats Grama
Carex bicknellii	Bicknell's Sedge
Elymus virginicus	Virginia Wild Rye
Schizachyrium scoparium	Little Bluestem
Sporobolus heterolepis	Prairie Dropseed
<i>Forbs</i>	
Asclepias syriaca	Common Milkweed
Asclepias tuberosa	Butterfly Milkweed
Aster ericoides	White Heath Aster
Coreopsis lanceolata	Sand Coreopsis
Coreopsis palmata	Prairie Coreopsis
Echinacea purpurea	Purple Coneflower
Gentiana andrewsii	Fringe-top Bottle Gentian
Helianthus occidentalis	Few-leaf Sunflower
Lespedeza capitata	Round-headed Bushclover
Liatris aspera	Rough Blazingstar
Liatris scariosa nieuwlandii	Savanna Blazingstar
Lupinus perennis	Wild Blue Lupine
Parthenium integrifolium	Wild Quinine
Penstemon digitalis	Foxglove Beard Tongue
Petalostemum purpureum	Purple Prairie Clover
Potentilla arguta	Tall Cinquefoil
Pycnanthemum virginianum	Mountain Mint
Rudbeckia fulgida	Showy Black-eyed Susan
Rudbeckia hirta	Black-eyed Susan
Solidago nemoralis	Gray Goldenrod
Tradescantia ohimensis	Ohio Spiderwort
Verbena stricta	Hoary Vervain
Zizia aurea	Golden Alexanders
<i>Temporary Cover Grasses</i>	
Avena sativa	Seed Oats

- D. Weed seed content shall not exceed 0.25 percent for any variety of seed mixture.  
E. Seed shall be mixed by the dealer. Furnish dealer's guaranteed statement of composition, mixture and percentages of purity, and germination of each variety.

PART 3. **EXECUTION**

3.01 **SEEDBED PREPARATION**

- A. Within all disturbed Project Areas, the surface of the topsoil shall be fine graded and prepared for seeding by removing rocks and debris larger than 2-inch diameter. All

Portage Creek Area Time Critical Removal Action  
EQM Project Number: 030281.0087  
Specifications 02920

KIESER & ASSOCIATES, LLC

windrows shall be eliminated. Hand raking shall be performed around all structures to form smooth transitions. The entire surface shall be finished to provide positive drainage.

3.02 **SEEDING & FERTILIZING**

- A. Contractor shall sow seed and fertilize all topsoiled restoration areas at the rates recommended by the seed supplier for each type of native seed mix specified.  
B. Seed and fertilizer shall be applied to all General Repair Areas and Spoil Areas at the approximate rates shown below. The Contractor shall submit a certified list of the actual seed percentages used in the General Repair Areas and Stockpile Areas.  
a. Seed at 350 pounds per acre  
b. Fertilize at 500 pounds per acre of 12-12-12

3.03 **MULCHING & EROSION CONTROLS**

- A. On the Project Areas receiving native seed mixes, the Contractor shall furnish and install mulch blankets at the locations and to the limits shown on the construction drawings. The mulch blanket shall be North American Green DS75 Straw Blankets. The Contractor shall install and anchor the mulch blankets with wood or metal stakes in accordance with the manufacturer's recommendations. Mechanical anchoring shall be performed in a manner that creates ridges perpendicular to flow of water. Where blankets are used in flow areas, the upstream end of each section shall be buried in a trench to a minimum depth of 6 inches. The Contractor shall water the mulch blanket areas at a rate of approximately 2,000 gallons per acre. Water may be obtained from the onsite creek.  
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Contact: Mark Cavanaugh  
425 36<sup>th</sup> Street SW  
Wyoming, MI 49548  
Ph: (616) 530-8230  
Ex: (616) 530-2317

- D. Minimum Erosion Control Products (as specified on the drawings).  
1. Straw Single Net Erosion Blankets (100% biodegradable).  
2. TerraTex HPG-44 Geotextile Fabric  
3. Ecolofence 24" Silt Fence

Portage Creek Area Time Critical Removal Action  
EQM Project Number: 030281.0087  
Specifications 02920

KIESER & ASSOCIATES, LLC



- E. Additional erosion control measures shall be implemented as required to minimize silt or sediment leaving the construction site. The Contractor shall monitor and maintain all erosion control devices throughout the duration of the construction period.
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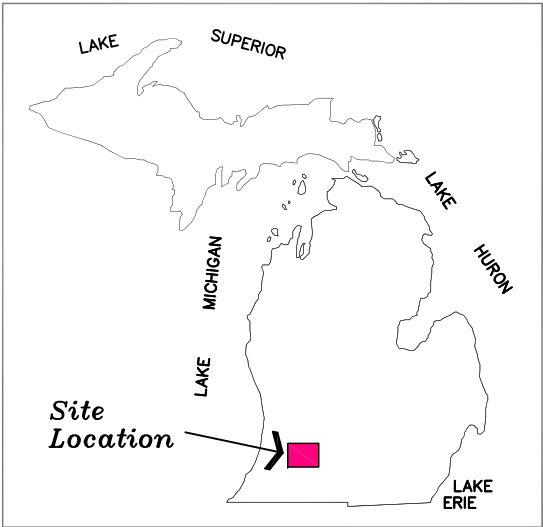
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- B. Replace dead or unhealthy plants with plants of the same size and species as specified. Species substitutions will not be allowed without engineer approval.

END OF SPECIFICATIONS

EQM CONTACT  
Environmental Quality Management  
18000 Carillon Boulevard  
Cincinnati, OH 45240  
(513)-309-4703  
Mr. Jeff Rhinefield

CONSULTANT CONTACT  
KIESER & ASSOCIATES, LLC  
536 E. Mich. Ave, Ste 300  
Kalamazoo, MI 49007  
(269) 344-7117  
Mr. Brian Boyer, P.E.

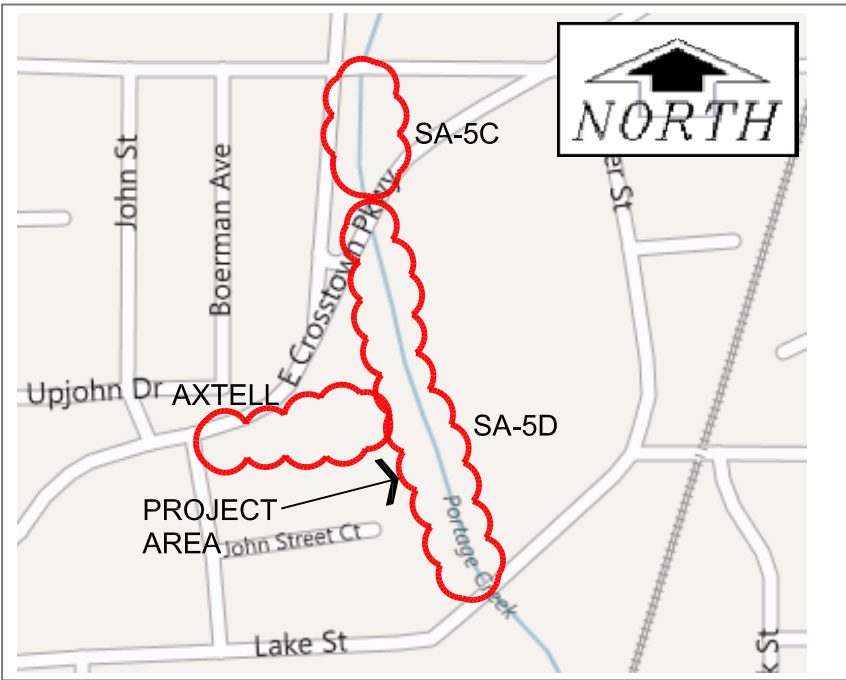


KALAMAZOO COUNTY, MICHIGAN



# PORTAGE CREEK TIME CRITICAL REMOVAL ACTION KALAMAZOO, MICHIGAN

EQM PROJECT NUMBER 030281.0087  
PORTAGE CREEK - SITE SA-5C & D, AXTELL



SITE LOCATION MAP

## INDEX OF DRAWING SHEETS

- |     |                                       |
|-----|---------------------------------------|
| 1   | Cover Sheet                           |
| 2   | Site SA 5-C&D, Axtell Vegetation Plan |
| 3   | Detail Drawings                       |
| 4-6 | Specifications                        |

## EROSION CONTROLS

1. ALL CONSTRUCTION SHALL COMPLY WITH THE SOIL EROSION AND SEDIMENTATION CONTROL ACT (P.A. 347 OF 1972, AS AMENDED).
2. ALL TEMPORARY EROSION CONTROLS SHALL BE REMOVED ONCE CONSTRUCTION IS COMPLETE.
3. TEMPORARY EROSION CONTROL MEASURES SHALL BE INSTALLED PRIOR TO COMMENCING WORK, TO THE EXTENT POSSIBLE.
4. CONTRACTOR TO PROTECT ONSITE CATCH BASINS FROM DAMAGE AND SEDIMENTATION.
5. ENSURE PROPER DRAINAGE FOLLOWING BACKFILL.
6. CONTRACTOR SHALL MONITOR AND MAINTAIN ALL SOIL EROSION CONTROL MEASURES FOR THE DURATION OF THE CONSTRUCTION PERIOD.
7. SUPPLEMENTAL SOIL EROSION CONTROLS SHALL BE INSTALLED AS NEEDED TO ENSURE

## GENERAL NOTES:

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2. No permitting is required for conducting re-vegetation work.
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4. Hard hats must be worn by anyone on the site who may be exposed to falling objects or flying debris and anyone within the operating range of overhead construction equipment. This equipment includes, but is not limited to, backhoes, cranes, draglines, and front end loaders.
5. Any deviation from these construction drawings and specifications will be considered defective work, subject to modification for conformance at the Contractor's expense.
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9. Hand dig in all areas of existing utilities.
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11. All work shall be checked for accuracy to the plans by the Contractor prior to installation.

CITY OF KALAMAZOO  
<http://www.kalamazoo.org/onlinegis/CXviewer.htm>  
T2s R11w, SE 1/4 of Section 22  
in Kalamazoo County, Michigan.



Know what's below.  
Call before you dig.  
1-800-482-7171

NOTES:  
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NOTE TO CONTRACTOR:  
3 FULL WORKING DAYS BEFORE YOU DIG, CALL "MISS DIG".



Area #5 - Plugs			
Common Name	Scientific Name	QTY.	UNIT
Nodding pink onion	<i>Allium ceruuum</i>	23	EA
Butterfly weed	<i>Asclepias tuberosa</i>	22	EA
Purple coneflower	<i>Echinacea purpurea</i>	22	EA
Great blue lobelia	<i>Lobelia siphilitica</i>	23	EA
Beebalm	<i>Monarda fistulosa</i>	22	EA
Spiderwort	<i>Tradescantia ohioensis</i>	22	EA
Blue vervain	<i>Verbena hastata</i>	22	EA

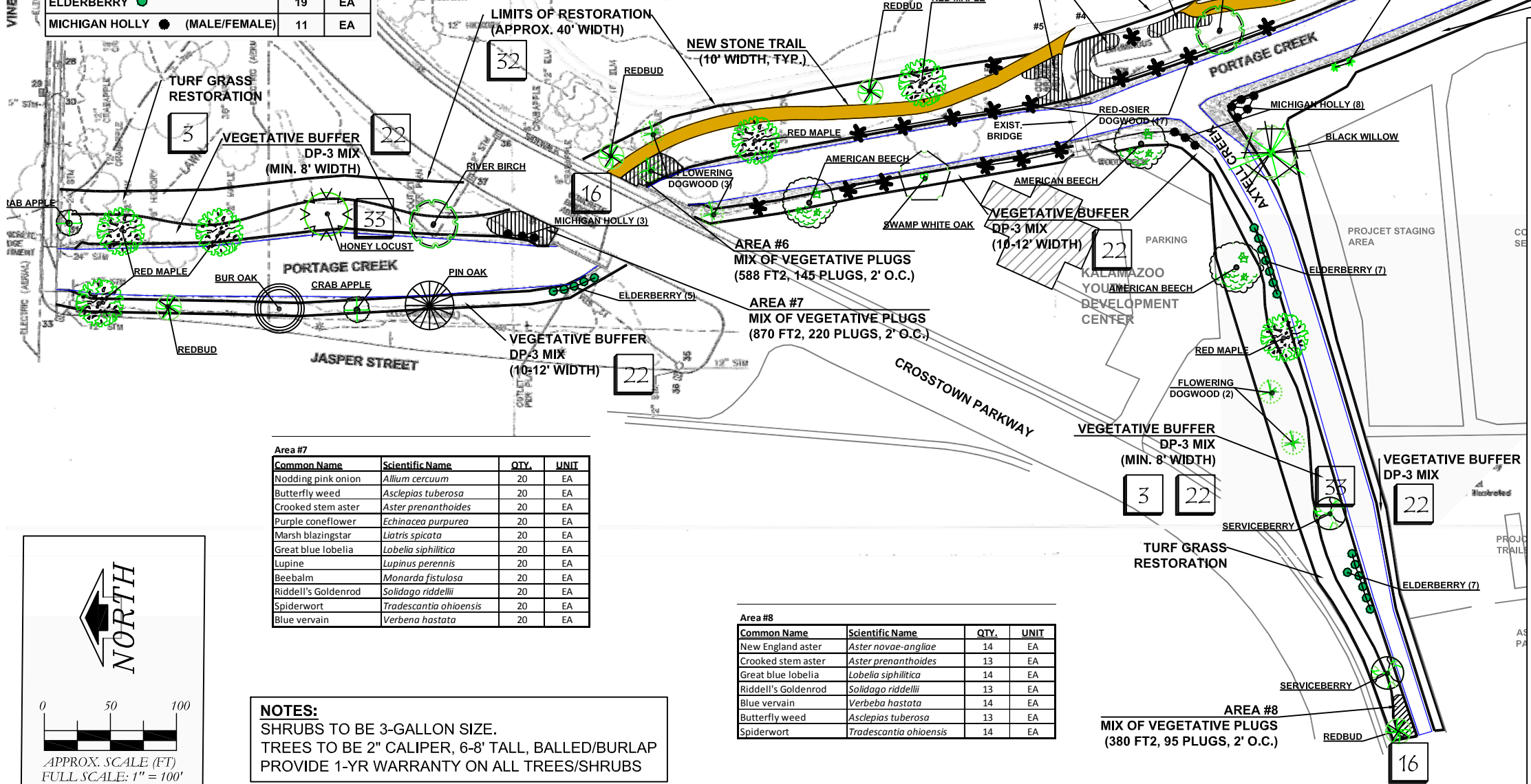
Area #6			
Common Name	Scientific Name	QTY.	UNIT
Nodding pink onion	<i>Allium cerceum</i>	14	EA
Butterfly weed	<i>Asclepias tuberosa</i>	13	EA
Crooked stem aster	<i>Aster prenanthoides</i>	13	EA
Purple coneflower	<i>Echinacea purpurea</i>	14	EA
Marsh blazingstar	<i>Liatris spicata</i>	13	EA
Great blue lobelia	<i>Lobelia siphilitica</i>	13	EA
Lupine	<i>Lupinus perennis</i>	13	EA
Beebalm	<i>Monarda fistulosa</i>	13	EA
Riddell's Goldenrod	<i>Solidago riddellii</i>	13	EA
Spiderwort	<i>Tradescantia ohioensis</i>	13	EA
Blue vervain	<i>Verbena hastata</i>	13	EA

Area #3 - Plugs			
Common Name	Scientific Name	QTY.	UNIT
Nodding pink onion	<i>Allium cercuum</i>	17	EA
Butterfly weed	<i>Asclepias tuberosa</i>	16	EA
Purple coneflower	<i>Echinacea purpurea</i>	17	EA
Great blue lobelia	<i>Lobelia siphilitica</i>	17	EA
Beebalm	<i>Monarda fistulosa</i>	16	EA
Spiderwort	<i>Tradescantia ohiensis</i>	16	EA
Blue vervain	<i>Verbena hastata</i>	16	EA

Area #4 - Plugs			
Common Name	Scientific Name	QTY.	UNIT
Nodding pink onion	<i>Allium cerceum</i>	31	EA
Butterfly weed	<i>Asclepias tuberosa</i>	30	EA
Purple coneflower	<i>Echinacea purpurea</i>	31	EA
Great blue lobelia	<i>Lobelia siphilitica</i>	31	EA
Beebalm	<i>Monarda fistulosa</i>	30	EA
Spiderwort	<i>Tradescantia ohioensis</i>	30	EA
Blue vervain	<i>Verbena hastata</i>	30	EA

Area #2 - Plugs			
Common Name	Scientific Name	QTY.	UNIT
Downing pink onion	<i>Allium cercurum</i>	13	EA
Butterfly weed	<i>Asclepias tuberosa</i>	13	EA
Crooked stem aster	<i>Aster prenanthoides</i>	13	EA
Purple coneflower	<i>Echinacea purpurea</i>	13	EA
Marsh blazingstar	<i>Liatris spicata</i>	13	EA
Great blue lobelia	<i>Lobelia siphilitica</i>	13	EA
Lupine	<i>Lupinus perennis</i>	13	EA
Beebalm	<i>Monarda fistulosa</i>	13	EA
Riddell's Goldenrod	<i>Solidago riddellii</i>	12	EA
Spiderwort	<i>Tradescantia ohioensis</i>	12	EA
Blue vervain	<i>Verbena hastata</i>	12	EA

Area #1 - Plugs			
Common Name	Scientific Name	QTY.	UNIT
New England aster	<i>Aster novae-angliae</i>	10	EA
Purple coneflower	<i>Echinacea purpurea</i>	10	EA
Evening primrose	<i>Oenothera biennis</i>	10	EA
Interrupted fern	<i>Osmundia claytoniana</i>	10	EA
Mad-dog skullcap	<i>Scutellaria lateriflora</i>	10	EA
Cup plant	<i>Silphium perfoliatum</i>	10	EA
Riddell's Goldenrod	<i>Solidago riddellii</i>	10	EA
Spiderwort	<i>Tradescantia ohiensis</i>	9	EA
Ironweed	<i>Vernonia fasciculata</i>	9	EA



**NOTES:**  
SHRUBS TO BE 3-GALLON SIZE.  
TREES TO BE 2" CALIPER, 6-8' TALL, BALLED/BURLAP  
PROVIDE 1-YR WARRANTY ON ALL TREES/SHRUBS

SOIL EROSION &amp; SEDIMENT CONTROL NOTES:

- 3 PERMANENT/TEMPORARY SEEDING
- 16 TREES, SHRUBS AND PERENNIALS
- 22 VEGETATIVE BUFFER AT WATERCOURSE
- 26 SILT FENCE
- 30 INLET PROTECTION GEOTEXTILE AND STONE
- 32 SOIL ROUGHENING AND SCARIFICATION
- 33 MULCH BLANKETS

REFERENCE:

MDOT SOIL EROSION AND SEDIMENT CONTROL  
MANUAL, APRIL 2006

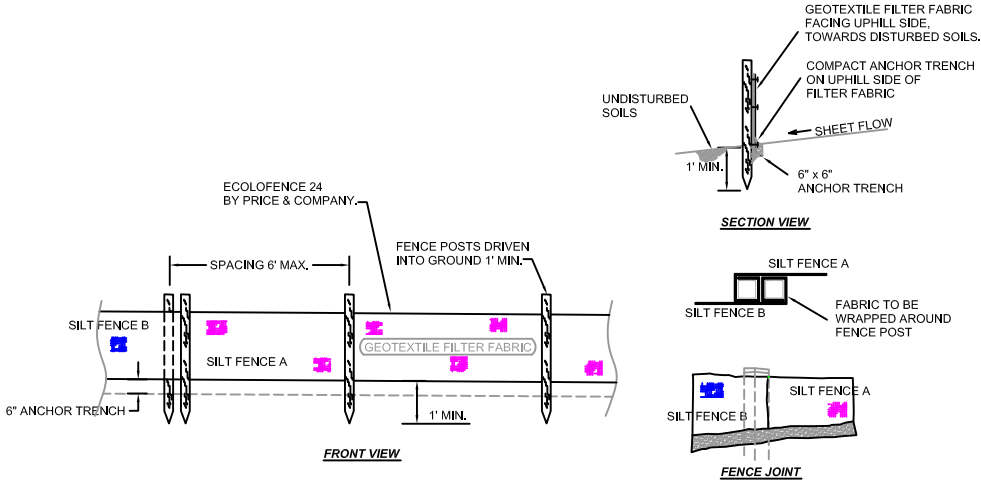
NOTES:

ALL TEMPORARY EROSION AND SEDIMENT CONTROLS SHALL BE COORDINATED WITH THE PERMANENT CONTROL MEASURES TO ASSURE EFFECTIVE CONTROL OF SEDIMENTS DURING CONSTRUCTION OF THE PROJECT.

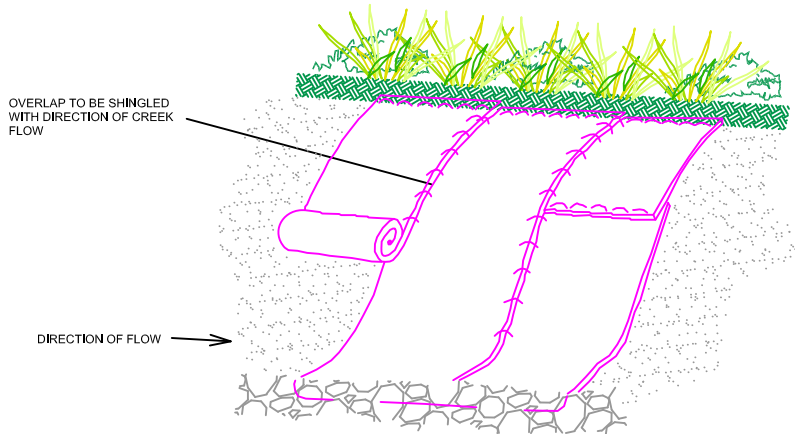
ALL TEMPORARY EROSION CONTROL DEVICES SHALL BE REMOVED AFTER VEGETATION HAS BEEN ESTABLISHED OR AT THE DISCRETION OF THE ENGINEER. THE CONTRACTOR SHALL TAKE CARE DURING REMOVAL TO MINIMIZE SEDIMENT IMPACT TO NEARBY SURFACE WATER FEATURES.

SOIL DISTURBANCE/REPAIR SEQUENCE:

INSTALL EROSION CONTROLS  
PREPARE SEEDBED, FINE GRADE, PLACE SEED  
INSTALL MULCH EROSION BLANKETS

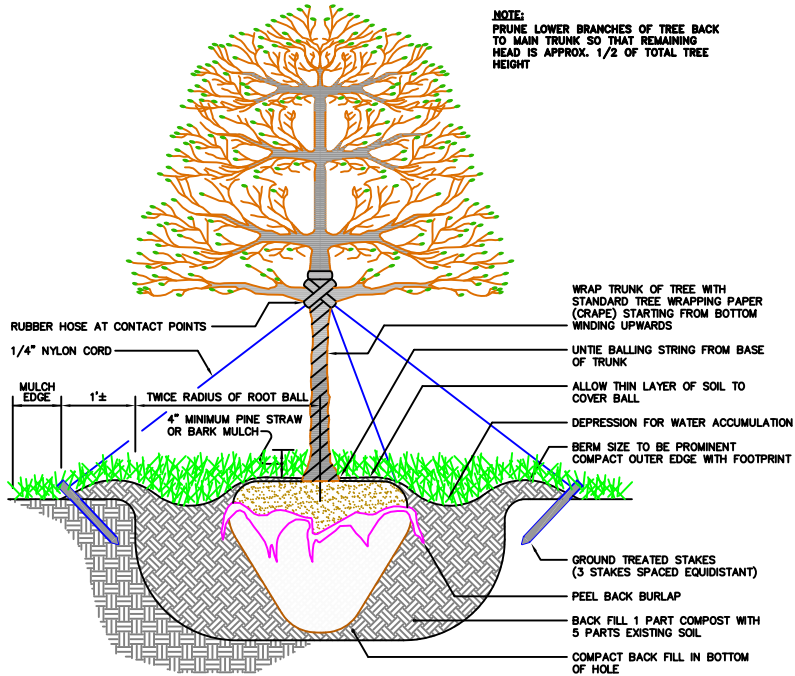


1  
3  
SOIL EROSION CONTROL  
GEOTEXTILE SILT FENCE  
NO SCALE

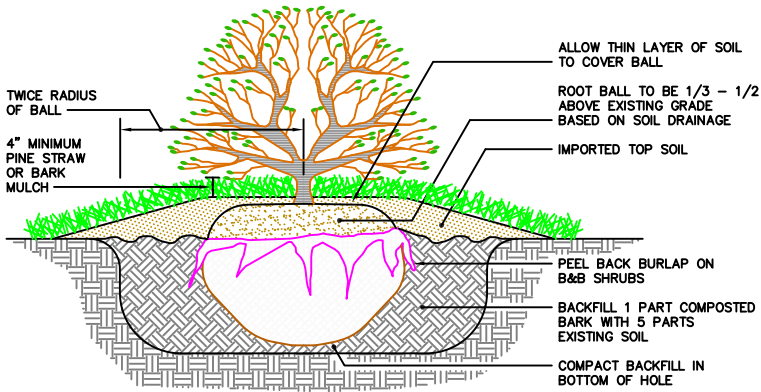


2  
3  
EROSION CONTROL BLANKET DETAIL  
NO SCALE

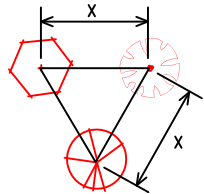
- NOTES:**
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  2. BEGIN AT THE TOP OF THE SLOPE BY ANCHORING THE BLANKET IN A 6" DEEP BY 6" WIDE TRENCH. BACKFILL AND COMPACT THE TRENCH AFTER PINNING.
  3. ROLL THE BLANKETS DOWN THE SLOPE IN THE DIRECTION OF THE WATER FLOW.
  4. THE EDGES OF PARALLEL BLANKETS MUST BE PINNED WITH APPROXIMATELY 2" OVERLAP.
  5. WHEN BLANKETS MUST BE SPICED DOWN THE SLOPE, PLACE BLANKETS END OVER END (SHINGLE STYLE) WITH APPROXIMATELY 6" OVERLAP. STAPLE THROUGH OVERLAPPED AREA, APPROXIMATELY 12" APART.
  6. BLANKETS SHALL BE PINNED IN ROWS NOT MORE THAN 2 FT O.C. WITH A MAXIMUM OF 20" BETWEEN PINS, 3.5 PINS PER SQ YD.
  7. LOWER END OF BLANKET TO BE TUCKED 6" MIN. BELOW EDGE OF TOE.



3  
3  
STAKING AND PLANTING  
TREE DETAIL  
NO SCALE

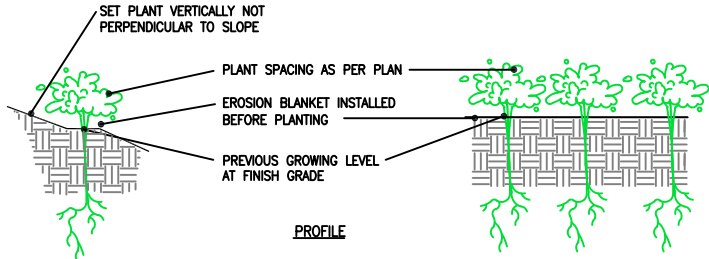


4  
3  
SHRUB DETAIL  
CONTAINER AND B&B  
NO SCALE



- NOTES:**
1. ON-CENTER PLANT SPACING INDICATED IN GROUND COVER SCHEDULE (SHEET 9).
  2. ALL PLUG MATERIALS SHALL BE TRUE TYPE AND NAME.

PLAN



5  
3  
PLANTING  
GROUND COVER - NO SCALE



# Portage Creek Area Time Critical Removal Action

EQM Project Number: 030281.0087  
PORTAGE CREEK SITE SA 5-C&D AXTELL

5536 E. MICHIGAN AVE., SUITE 300  
KALAMAZOO, MI 49007  
ph: (269) 344-7117 fax: (269) 344-2493

- KIESER & ASSOCIATES**  
ENVIRONMENTAL SCIENCE & ENGINEERING

B. All special native seed mixes shall be purchased from the following supplier:  
**1) Heartland Restoration Services, Inc. Contact: Eric Ummel**  
 14921 Hand Road  
 Fort Wayne, Indiana 46818  
 Ph: (260) 489-8511  
 Fx: (260) 489-8607  
 Email: mail@earthsourceinc.net

- Trees, shrubs and plugs (refer to tree/shrub schedule on the drawings) shall be purchased from the following supplier(s) to the extent possible (as current stock allows):

2) **Wildtype Native Plant Nursery** **Contact:** Bill Schneider  
900 N. Every Road  
Mason, MI 48854  
Ph: (517) 244-1140  
Fax: (517) 244-1142  
E-mail: [wildtype@msu.edu](mailto:wildtype@msu.edu)

- 3) Hidden Savanna Nursery**  
18 N Van Kal Street  
Kalamazoo, MI 49009  
Ph: (269)352-3876  
Email: [info@hiddensavanna.com](mailto:info@hiddensavanna.com)

**4) American Roots**  
1958 Hidden Lake Trail  
Ortonville, MI 48462  
Ph: (248) 627-8525 or (248) 882-7768  
Fax: (248) 627-3865  
Email: [americanrootsnat@aol.com](mailto:americanrootsnat@aol.com)

- 5) Sandhill Farm**  
11250 10 Mile Road  
Rockford, MI 49341-7954  
Ph: (616) 691-8214  
Fax: (616) 691-7872  
Email: [cheryltf@iscrv.net](mailto:cheryltf@iscrv.net)

**6) Mary Ann's Michigan Trees & Shrubs** **Contact: Mary Ann Menck**  
28092 M-40 Hwy.  
Paw Paw, MI 49079  
Phone: (269) 628-2474  
Email: [mamencck@mei.net](mailto:mamencck@mei.net)

- Portage Creek Area Time Critical Removal Action  
EQM Project Number: 030281.0087  
Specifications 02920

**KIESER & ASSOCIATES, LLC**

## Page 1

- A. Topsoil
- Existing topsoil shall be re-used.
  - Import additional topsoil as needed.
- B. Water
- To be furnished by the Contractor. Portage Creek is an acceptable source.

## Page 2

- A. Seed shall be new crop, cleaned, and comprising of the following varieties mixed in proportion by weight shown and testing the minimum percentages and germination indicated as follows:

- A Type "A" Seed Mixture (Repair of General Lawn Areas)

C. Special Native Seed Mixes  
1) **Midwestern Short Stature Prairie Seed Mix (DP3)**

Approximate mix weight 43 lb/acre with 74 native seeds/sq.ft.  
44.4% Grasses/Sedges/Rushes; 44.1% Forbs; 11.4% Temporary Cover Grasses

Scientific Name	Common Name
<i>Grasses, Sedges, and Rushes</i>	
Bouteloua curtipendula	Side Oats Grama
Carex bicknellii	Bicknell's Sedge
Elymus virginicus	Virginia Wild Rye
Schizachyrium scoparium	Little Bluestem
Sporobolus heterolepis	Prairie Dropseed
<i>Forbs</i>	
Asclepias syriaca	Common Milkweed
Asclepias tuberosa	Butterfly Milkweed
Aster ericoides	White Heath Aster
Coreopsis lanceolata	Sand Coreopsis
Coreopsis palmata	Prairie Coreopsis
Echinacea purpurea	Purple Coneflower
Gentiana andrewsii	Fringe-top Bottle Gentian
Helianthus occidentalis	Few-leaf Sunflower
Lespedeza capitata	Round-headed Bushclover
Liatris aspera	Rough Blazingstar
Liatris scariosa nieuwlandii	Savanna Blazingstar
Lupinus perennis	Wild Blue Lupine
Parthenium integrifolium	Wild Quinine
Penstemon digitalis	Foxglove Beard Tongue
Petalostemum purpureum	Purple Prairie Clover
Potentilla arguta	Tall Cinquefoil
Pycnanthemum virginianum	Mountain Mint
Rudbeckia fulgida	Showy Black-eyed Susan
Rudbeckia hirta	Black-eyed Susan
Solidago nemoralis	Gray Goldenrod
Tradescantia ohiensis	Ohio Spiderwort
Verbena stricta	Hoary Vervain
Zizia aurea	Golden Alexanders
<i>Temporary Cover Grasses</i>	
Avena sativa	Seed Oats

- D. Weed seed content shall not exceed 0.25 percent for any variety of seed mixture.  
E. Seed shall be mixed by the dealer. Furnish dealer's guaranteed statement of composition, mixture and percentages of purity, and germination of each variety.

PART 3. **EXECUTION**

3.01 **SEEDBED PREPARATION**

- A. Within all disturbed Project Areas, the surface of the topsoil shall be fine graded and prepared for seeding by removing rocks and debris larger than 2-inch diameter. All

Portage Creek Area Time Critical Removal Action  
EQM Project Number: 030281.0087  
Specifications 02920

KIESER & ASSOCIATES, LLC

windrows shall be eliminated. Hand raking shall be performed around all structures to form smooth transitions. The entire surface shall be finished to provide positive drainage.

3.02 **SEEDING & FERTILIZING**

- A. Contractor shall sow seed and fertilize all topsoiled restoration areas at the rates recommended by the seed supplier for each type of native seed mix specified.  
B. Seed and fertilizer shall be applied to all General Repair Areas and Spoil Areas at the approximate rates shown below. The Contractor shall submit a certified list of the actual seed percentages used in the General Repair Areas and Stockpile Areas.  
a. Seed at 350 pounds per acre  
b. Fertilize at 500 pounds per acre of 12-12-12

3.03 **MULCHING & EROSION CONTROLS**

- A. On the Project Areas receiving native seed mixes, the Contractor shall furnish and install mulch blankets at the locations and to the limits shown on the construction drawings. The mulch blanket shall be North American Green DS75 Straw Blankets. The Contractor shall install and anchor the mulch blankets with wood or metal stakes in accordance with the manufacturer's recommendations. Mechanical anchoring shall be performed in a manner that creates ridges perpendicular to flow of water. Where blankets are used in flow areas, the upstream end of each section shall be buried in a trench to a minimum depth of 6 inches. The Contractor shall water the mulch blanket areas at a rate of approximately 2,000 gallons per acre. Water may be obtained from the onsite creek.  
B. Shredded straw mulch shall be applied at a rate of 2 tons per acre on the adjacent disturbed general lawn areas and spoils fill areas. Shredded straw mulch shall only be applied when wind speeds are 5 mph or less, except if approved otherwise by the Owner. The shredded straw mulch shall be anchored with a sharp-edged "crimping tool". The crimping tool shall be capable of partially cutting, embedding and anchoring the straw so it will not be blown away. The entire surface of the mulched Project shall receive two passes of the crimping tool. The second pass shall be 90 degrees to the first, unless approved otherwise by the Owner.  
C. All soil erosion control products, including (but not limited to) silt fence, erosion control blankets, mulch netting, biostake anchoring pins, non-woven geotextile fabric, and coir logs shall be purchased from the following supplier:

**Price and Company, Inc.**  
425 36<sup>th</sup> Street SW  
Wyoming, MI 49548  
Ph: (616) 530-8230  
Fx: (616) 530-2317

- D. Minimum Erosion Control Products (as specified on the drawings).  
1. DS75 Degradable Single Net Straw Blankets (100% biodegradable).  
2. Propex 4553 Non-woven Geotextile Fabric  
3. Ecolofence 24 Silt Fence

Portage Creek Area Time Critical Removal Action  
EQM Project Number: 030281.0087  
Specifications 02920

KIESER & ASSOCIATES, LLC



- E.     Additional erosion control measures shall be implemented as required to minimize silt or sediment leaving the construction site. The Contractor shall monitor and maintain all erosion control devices throughout the duration of the construction period.
  
- F.     All temporary erosion control devices should be in place prior to the start of construction/excavation activities, to the extent possible. The Contractor shall remove all temporary erosion control devices once full vegetation has been established.

3.04    MAINTENANCE

- A.     Maintenance responsibilities begin immediately upon completion of seeding and planting, and shall continue for a period of 1-year. All wind, water, fire, vandalism, or natural damage that occurs during this time frame shall be repaired by the Contractor within 5 days of being notified by EQM at no additional cost to the project. Repairs shall be completed in a manner that meets the requirements of these specifications.

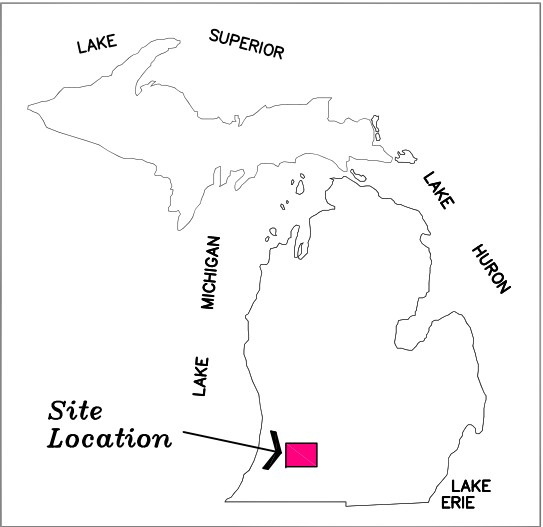
3.05    GUARANTEE

- A.     It is the responsibility of the Contractor to establish and maintain a dense growth of vegetation, for a period of 1-year. All trees and shrubs shall be provided with a minimum 1-year warrantee. Institute measures to protect completed landscape areas. Any part of the area that fails to show a uniform germination shall be re-seeded and such re-seeding shall continue until a dense growth is established. The Contractor shall repair damage to seeded areas resulting from erosion and/or overwatering.
  
- B.     Replace dead or unhealthy plants with plants of the same size and species as specified. Species substitutions will not be allowed without engineer approval.

END OF SPECIFICATIONS

EQM CONTACT  
Environmental Quality Management  
18000 Carillon Boulevard  
Cincinnati, OH 45240  
(513)-309-4703  
Mr. Jeff Rhinefield

CONSULTANT CONTACT  
KIESER & ASSOCIATES, LLC  
536 E. Mich. Ave, Ste 300  
Kalamazoo, MI 49007  
(269) 344-7117  
Mr. Brian Boyer, P.E.



KALAMAZOO COUNTY, MICHIGAN



PORTAGE CREEK TIME CRITICAL REMOVAL ACTION  
KALAMAZOO, MICHIGAN  
EQM PROJECT NUMBER 030281.0087  
PORTAGE CREEK - SITE SA-6

INDEX OF DRAWING SHEETS	
1	Cover Sheet
2	Site SA-6 Vegetation Plan
3	Detail Drawings
4-6	Specifications



SITE LOCATION MAP

CITY OF KALAMAZOO  
<http://www.kalamazoo.org/onlinegis/CXviewer.htm>  
T2s R11w, SE 1/4 of Section 22  
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EROSION CONTROLS

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2. ALL TEMPORARY EROSION CONTROLS SHALL BE REMOVED ONCE CONSTRUCTION IS COMPLETE.
3. TEMPORARY EROSION CONTROL MEASURES SHALL BE INSTALLED PRIOR TO COMMENCING WORK, TO THE EXTENT POSSIBLE.
4. CONTRACTOR TO PROTECT ONSITE CATCH BASINS FROM DAMAGE AND SEDIMENTATION.
5. ENSURE PROPER DRAINAGE FOLLOWING BACKFILL.
6. CONTRACTOR SHALL MONITOR AND MAINTAIN ALL SOIL EROSION CONTROL MEASURES FOR THE DURATION OF THE CONSTRUCTION PERIOD.
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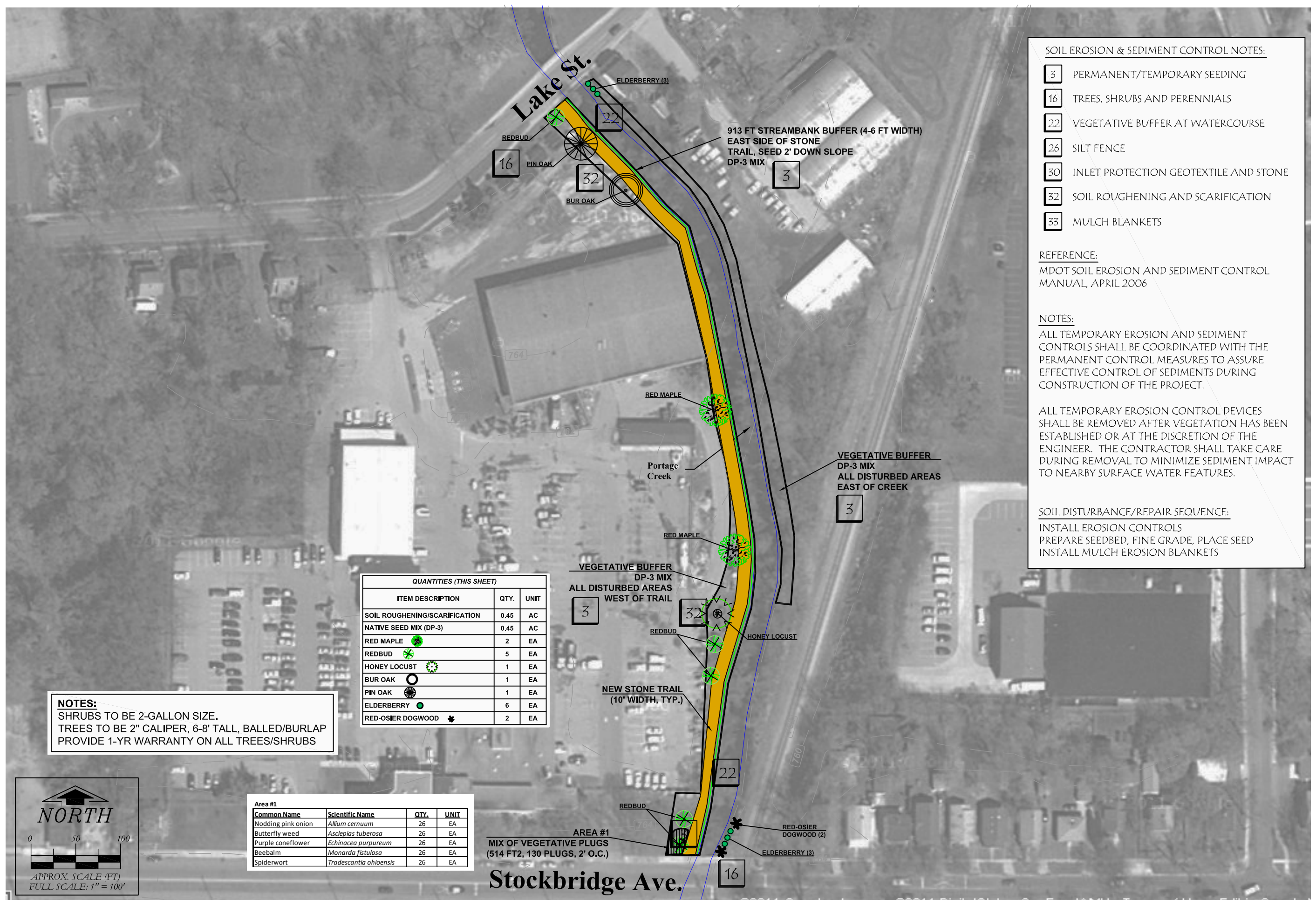


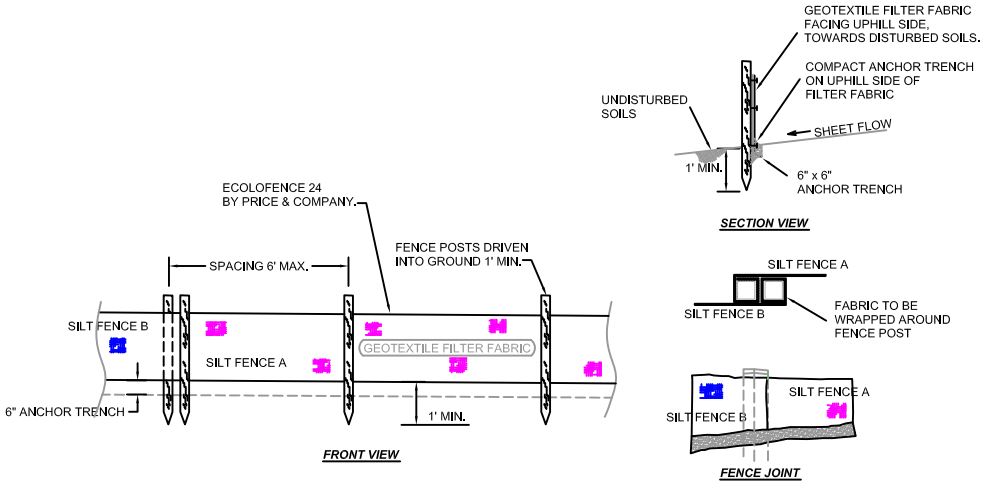
**KALAMAZOO, MI**

EQM Project Number: 030281.0087  
PORTAGE CREEK SITE SA-6

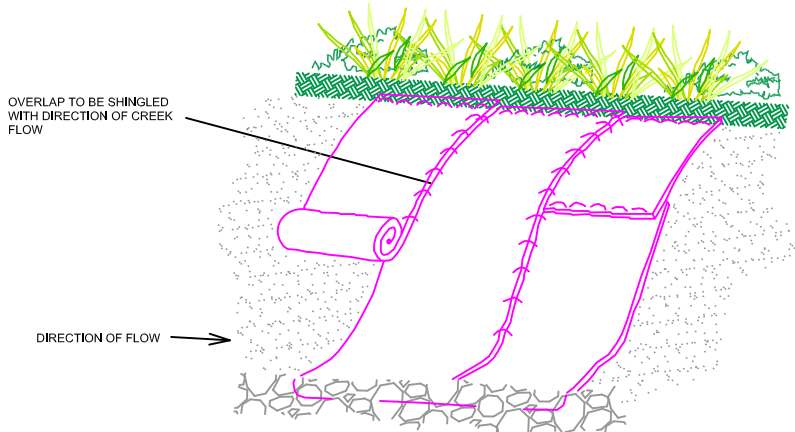
536 E. MICHIGAN AVE., SUITE 300  
KALAMAZOO, MI 49007  
ph: (269) 344-7117 fax: (269) 344-2493

**KIESER & ASSOCIATES**  
ENVIRONMENTAL SCIENCE & ENGINEERING



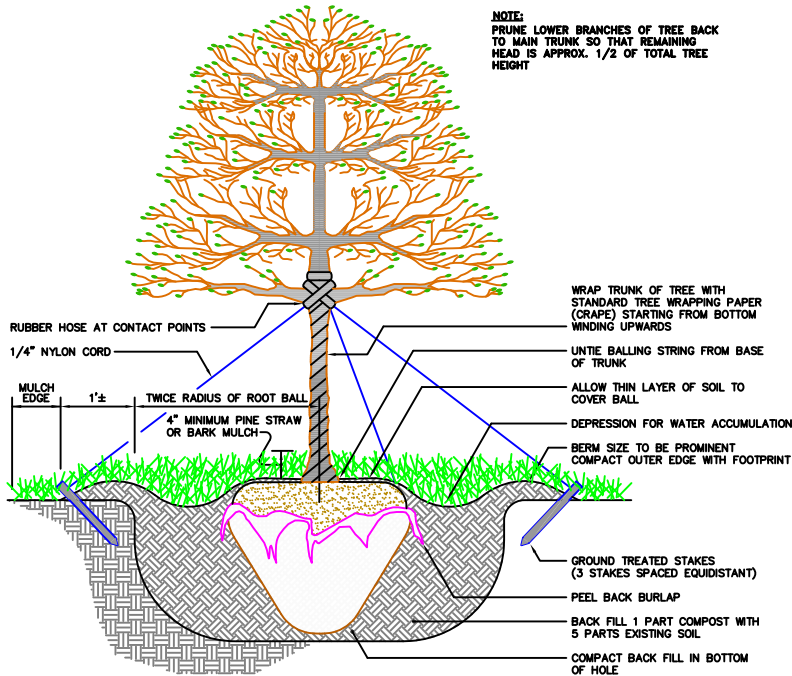


**1**  
**3** SOIL EROSION CONTROL  
GEOTEXTILE SILT FENCE  
NO SCALE

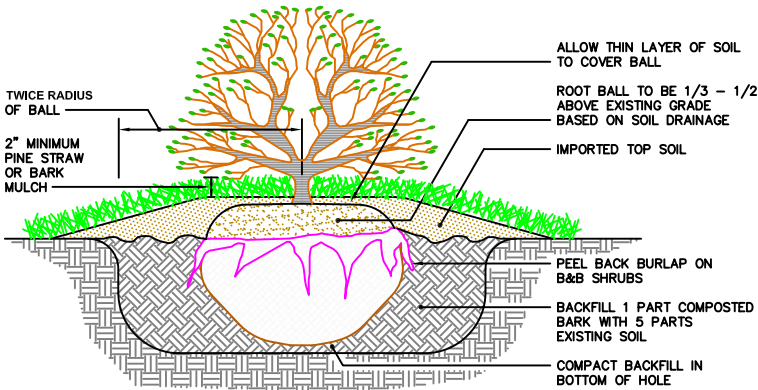


**2**  
**3** EROSION CONTROL BLANKET DETAIL  
NO SCALE

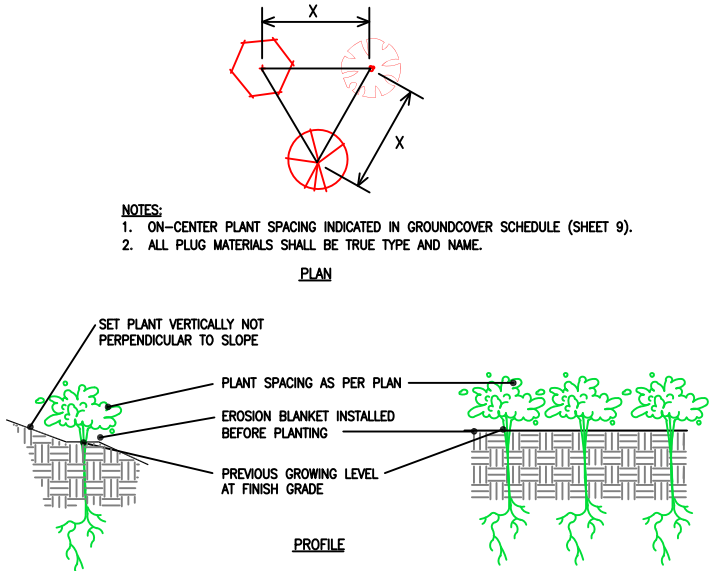
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**3**  
**3** STAKING AND PLANTING  
TREE DETAIL  
NO SCALE



**4**  
**3** SHRUB DETAIL  
CONTAINER AND B&B  
NO SCALE



**5**  
**3** PLANTING  
GROUND COVER - NO SCALE





C. Special Native Seed Mixes

1) Midwestern Short Stature Prairie Seed Mix (DP3)

Approximate mix weight 43 lb/acre with 74 native seeds/sq.ft.  
 44.4% Grasses/Sedges/Rushes; 44.1% Forbs; 11.4% Temporary Cover Grasses

Scientific Name	Common Name
<i>Grasses, Sedges, and Rushes</i>	
Bouteloua curtipendula	Side Oats Grama
Carex bicknellii	Bicknell's Sedge
Elymus virginicus	Virginia Wild Rye
Schizachyrium scoparium	Little Bluestem
Sporobolus heterolepis	Prairie Dropseed
<i>Forbs</i>	
Asclepias syriaca	Common Milkweed
Asclepias tuberosa	Butterfly Milkweed
Aster ericoides	White Heath Aster
Coreopsis lanceolata	Sand Coreopsis
Coreopsis palmata	Prairie Coreopsis
Echinacea purpurea	Purple Coneflower
Gentiana andrewsii	Fringe-top Bottle Gentian
Helianthus occidentalis	Few-leaf Sunflower
Lespedeza capitata	Round-headed Bushclover
Liatris aspera	Rough Blazingstar
Liatris scariosa nieuwlandii	Savanna Blazingstar
Lupinus perennis	Wild Blue Lupine
Parthenium integrifolium	Wild Quinine
Penstemon digitalis	Foxglove Beard Tongue
Petalostemum purpureum	Purple Prairie Clover
Potentilla arguta	Tall Cinquefoil
Pycnanthemum virginianum	Mountain Mint
Rudbeckia fulgida	Showy Black-eyed Susan
Rudbeckia hirta	Black-eyed Susan
Solidago nemoralis	Gray Goldenrod
Tradescantia ohimensis	Ohio Spiderwort
Verbena stricta	Hoary Vervain
Zizia aurea	Golden Alexanders
<i>Temporary Cover Grasses</i>	
Avena sativa	Seed Oats

- D. Weed seed content shall not exceed 0.25 percent for any variety of seed mixture.
- E. Seed shall be mixed by the dealer. Furnish dealer's guaranteed statement of composition, mixture and percentages of purity, and germination of each variety.

PART 3. EXECUTION

3.01 SEEDBED PREPARATION

- A. Within all disturbed Project Areas, the surface of the topsoil shall be fine graded and prepared for seeding by removing rocks and debris larger than 2-inch diameter. All

Portage Creek Area Time Critical Removal Action  
 EQM Project Number: 030281.0087  
 Specifications 02920

KIESER & ASSOCIATES, LLC

windrows shall be eliminated. Hand raking shall be performed around all structures to form smooth transitions. The entire surface shall be finished to provide positive drainage.

3.02 SEEDING & FERTILIZING

- A. Contractor shall sow seed and fertilize all topsoiled restoration areas at the rates recommended by the seed supplier for each type of native seed mix specified.
- B. Seed and fertilizer shall be applied to all General Repair Areas and Spoil Areas at the approximate rates shown below. The Contractor shall submit a certified list of the actual seed percentages used in the General Repair Areas and Stockpile Areas.
 

a. Seed at 350 pounds per acre

b. Fertilize at 500 pounds per acre of 12-12-12

3.03 MULCHING & EROSION CONTROLS

- A. On the Project Areas receiving native seed mixes, the Contractor shall furnish and install mulch blankets at the locations and to the limits shown on the construction drawings. The mulch blanket shall be North American Green DS75 Straw Blankets. The Contractor shall install and anchor the mulch blankets with wood or metal stakes in accordance with the manufacturer's recommendations. Mechanical anchoring shall be performed in a manner that creates ridges perpendicular to flow of water. Where blankets are used in flow areas, the upstream end of each section shall be buried in a trench to a minimum depth of 6 inches. The Contractor shall water the mulch blanket areas at a rate of approximately 2,000 gallons per acre. Water may be obtained from the onsite creek.
- B. Shredded straw mulch shall be applied at a rate of 2 tons per acre on the adjacent disturbed general lawn areas and spoils fill areas. Shredded straw mulch shall only be applied when wind speeds are 5 mph or less, except if approved otherwise by the Owner. The shredded straw mulch shall be anchored with a sharp-edged "crimping tool". The crimping tool shall be capable of partially cutting, embedding and anchoring the straw so it will not be blown away. The entire surface of the mulched Project shall receive two passes of the crimping tool. The second pass shall be 90 degrees to the first, unless approved otherwise by the Owner.
- C. All soil erosion control products, including (but not limited to) silt fence, erosion control blankets, mulch netting, biostake anchoring pins, non-woven geotextile fabric, and coir logs shall be purchased from the following supplier:

Price and Company, Inc.  
 425 36<sup>th</sup> Street SW  
 Wyoming, MI 49548  
 Ph: (616) 530-8230  
 Fx: (616) 530-2317

- D. Minimum Erosion Control Products (as specified on the drawings).
1. DS75 Degradable Single Net Straw Blankets (100% biodegradable).
2. Propex 4553 Non-woven Geotextile Fabric
3. Ecolofence 24 Silt Fence

Portage Creek Area Time Critical Removal Action  
 EQM Project Number: 030281.0087  
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KIESER & ASSOCIATES, LLC

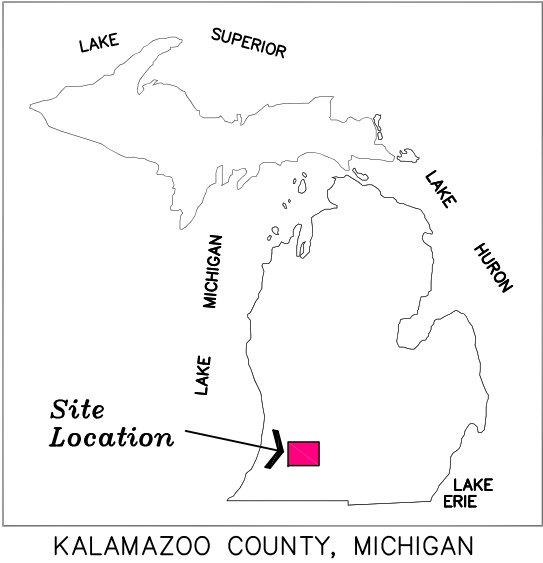


- E. Additional erosion control measures shall be implemented as required to minimize silt or sediment leaving the construction site. The Contractor shall monitor and maintain all erosion control devices throughout the duration of the construction period.
  - F. All temporary erosion control devices should be in place prior to the start of construction/excavation activities, to the extent possible. The Contractor shall remove all temporary erosion control devices once full vegetation has been established.
- 3.04 MAINTENANCE
- A. Maintenance responsibilities begin immediately upon completion of seeding and planting, and shall continue for a period of 1-year. All wind, water, fire, vandalism, or natural damage that occurs during this time frame shall be repaired by the Contractor within 5 days of being notified by EQM at no additional cost to the project. Repairs shall be completed in a manner that meets the requirements of these specifications.
- 3.05 GUARANTEE
- A. It is the responsibility of the Contractor to establish and maintain a dense growth of vegetation, for a period of 1-year. All trees and shrubs shall be provided with a minimum 1-year warrantee. Institute measures to protect completed landscape areas. Any part of the area that fails to show a uniform germination shall be re-seeded and such re-seeding shall continue until a dense growth is established. The Contractor shall repair damage to seeded areas resulting from erosion and/or overwatering.
  - B. Replace dead or unhealthy plants with plants of the same size and species as specified. Species substitutions will not be allowed without engineer approval.

END OF SPECIFICATIONS

EQM CONTACT  
Environmental Quality Management  
18000 Carillon Boulevard  
Cincinnati, OH 45240  
(513)-309-4703  
Mr. Jeff Rhinefield

CONSULTANT CONTACT  
KIESER & ASSOCIATES, LLC  
536 E. Mich. Ave, Ste 300  
Kalamazoo, MI 49007  
(269) 344-7117  
Mr. Brian Boyer, P.E.



# PORTAGE CREEK TIME CRITICAL REMOVAL ACTION KALAMAZOO, MICHIGAN

EQM PROJECT NUMBER 030281.0087  
PORTAGE CREEK - SITE SA-7



SITE LOCATION MAP

INDEX OF DRAWING SHEETS	
1	Cover Sheet
2	Site SA-7 Vegetation Plan (North)
3	Site SA-7 Vegetation Plan (South)
4	Detail Drawings
5-7	Specifications

EROSION CONTROLS	
1.	ALL CONSTRUCTION SHALL COMPLY WITH THE SOIL EROSION AND SEDIMENTATION CONTROL ACT (P.A. 347 OF 1972, AS AMENDED).
2.	ALL TEMPORARY EROSION CONTROLS SHALL BE REMOVED ONCE CONSTRUCTION IS COMPLETE.
3.	TEMPORARY EROSION CONTROL MEASURES SHALL BE INSTALLED PRIOR TO COMMENCING WORK, TO THE EXTENT POSSIBLE.
4.	CONTRACTOR TO PROTECT ONSITE CATCH BASINS FROM DAMAGE AND SEDIMENTATION.
5.	ENSURE PROPER DRAINAGE FOLLOWING BACKFILL.
6.	CONTRACTOR SHALL MONITOR AND MAINTAIN ALL SOIL EROSION CONTROL MEASURES FOR THE DURATION OF THE CONSTRUCTION PERIOD.
7.	SUPPLEMENTAL SOIL EROSION CONTROLS SHALL BE INSTALLED AS NEEDED TO ENSURE

GENERAL NOTES:	
1.	The Contractor is responsible for contacting MISS DIG (1-800-482-7171) at least 3 working days before construction begins. The Contractor shall provide the MISS DIG ticket number upon request. Any utility conflicts must be presented to the Engineer in writing prior to commencement of work.
2.	No permitting is required for conducting re-vegetation work.
3.	The Contractor is responsible for knowing and following all appropriate safety standards which are required by the Michigan Occupational Safety and Health Act.
4.	Hard hats must be worn by anyone on the site who may be exposed to falling objects or flying debris and anyone within the operating range of overhead construction equipment. This equipment includes, but is not limited to, backhoes, cranes, draglines, and front end loaders.
5.	Any deviation from these construction drawings and specifications will be considered defective work, subject to modification for conformance at the Contractor's expense.
6.	Contractor shall keep disturbance of all areas of construction to a minimum.
7.	Locations and elevations of existing utilities are not exact. Contact Miss Dig at 1-800-482-7171, prior to beginning construction.
8.	Existing utilities destroyed or disturbed by the Contractor's operations shall be repaired at the Contractor's expense.
9.	Hand dig in all areas of existing utilities.
10.	The contractor shall be required to prevent movement of soil off site. Additional silt fencing may be required beyond that already on-site. Any additional silt fencing shall be incidental to work.
11.	All work shall be checked for accuracy to the plans by the Contractor prior to installation.

CITY OF KALAMAZOO  
<http://www.kalamazoo.org/onlinegis/CXviewer.htm>  
T2s R11w, SE 1/4 of Section 22  
in Kalamazoo County, Michigan.



Know what's below.  
Call before you dig.  
1-800-482-7171

NOTES:  
ALL EXISTING UTILITY LOCATIONS DEPICTED ON THESE PLANS ARE APPROXIMATE; BASED ON AVAILABLE INFORMATION AND FIELD OBSERVATIONS BY OTHERS. AS A RESULT, UTILITY LOCATIONS SHOWN ARE NOT EXACT. DO NOT ASSUME THESE ARE THE ONLY UTILITIES PRESENT.

NOTE TO CONTRACTOR:  
3 FULL WORKING DAYS BEFORE YOU DIG, CALL "MISS DIG".





SOIL EROSION & SEDIMENT CONTROL NOTES:

- 3 PERMANENT/TEMPORARY SEEDING
- 16 TREES, SHRUBS AND PERENNIALS
- 22 VEGETATIVE BUFFER AT WATERCOURSE
- 26 SILT FENCE
- 30 INLET PROTECTION GEOTEXTILE AND STONE
- 32 SOIL ROUGHENING AND SCARIFICATION
- 33 MULCH BLANKETS







REFERENCE:  
MDOT SOIL EROSION AND SEDIMENT CONTROL  
MANUAL, APRIL 2006

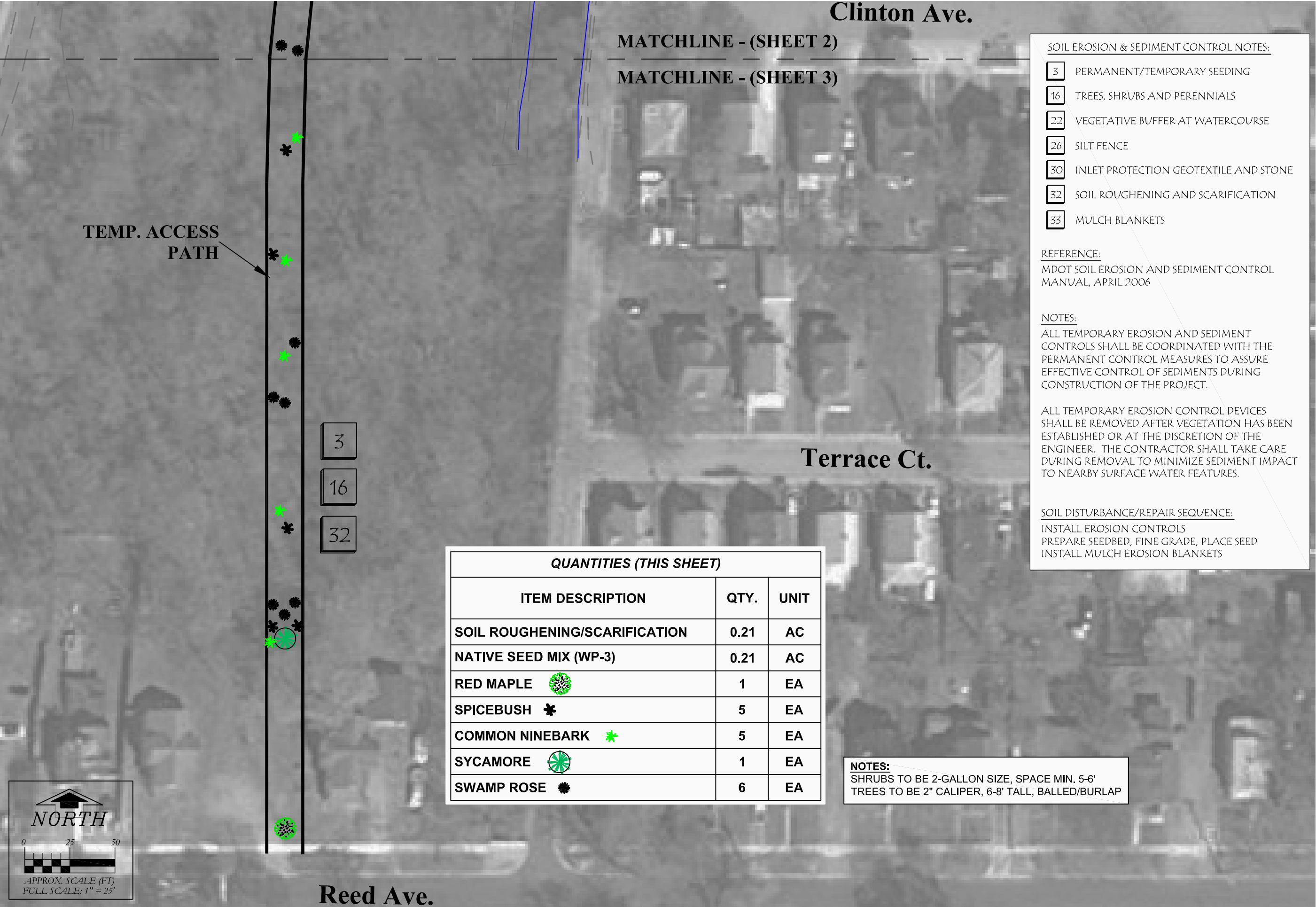
NOTES:  
ALL TEMPORARY EROSION AND SEDIMENT  
CONTROLS SHALL BE COORDINATED WITH THE  
PERMANENT CONTROL MEASURES TO ASSURE  
EFFECTIVE CONTROL OF SEDIMENTS DURING  
CONSTRUCTION OF THE PROJECT.

ALL TEMPORARY EROSION CONTROL DEVICES  
SHALL BE REMOVED AFTER VEGETATION HAS BEEN  
ESTABLISHED OR AT THE DISCRETION OF THE  
ENGINEER. THE CONTRACTOR SHALL TAKE CARE  
DURING REMOVAL TO MINIMIZE SEDIMENT IMPACT  
TO NEARBY SURFACE WATER FEATURES.

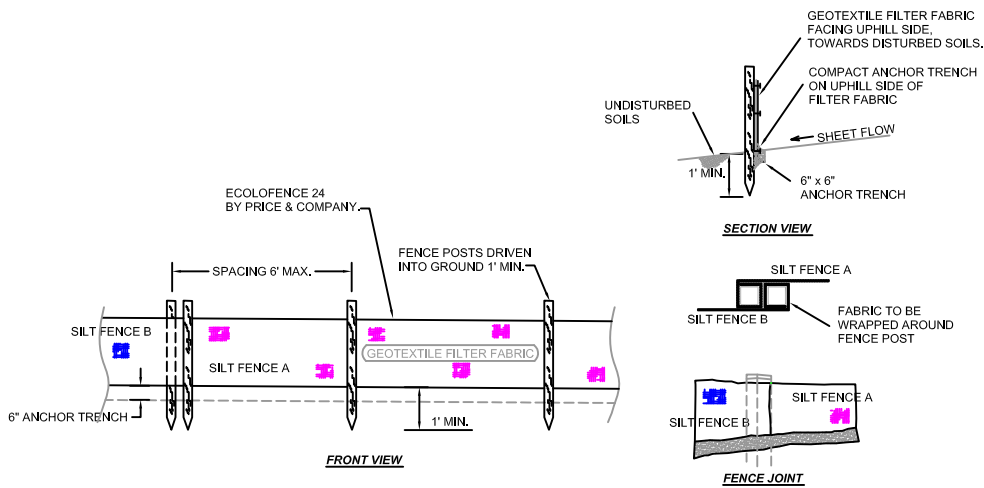
SOIL DISTURBANCE/REPAIR SEQUENCE:  
INSTALL EROSION CONTROLS  
PREPARE SEEDBED, FINE GRADE, PLACE SEED  
INSTALL MULCH EROSION BLANKETS

NOTES:  
SHRUBS TO BE 2-GALLON SIZE, SPACE MIN.5-6'  
TREES TO BE 1" CALIPER, 4-6' TALL, BALLED/BURLAP

QUANTITIES (THIS SHEET)		
ITEM DESCRIPTION	QTY.	UNIT
SOIL ROUGHENING/SCARIFICATION	0.36	AC
NATIVE SEED MIX (WP-3)	0.36	AC
RED MAPLE 	1	EA
SPICEBUSH 	6	EA
COMMON NINEBARK 	7	EA
SYCAMORE 	1	EA
SWAMP WHITE OAK 	2	EA
SWAMP ROSE 	11	EA



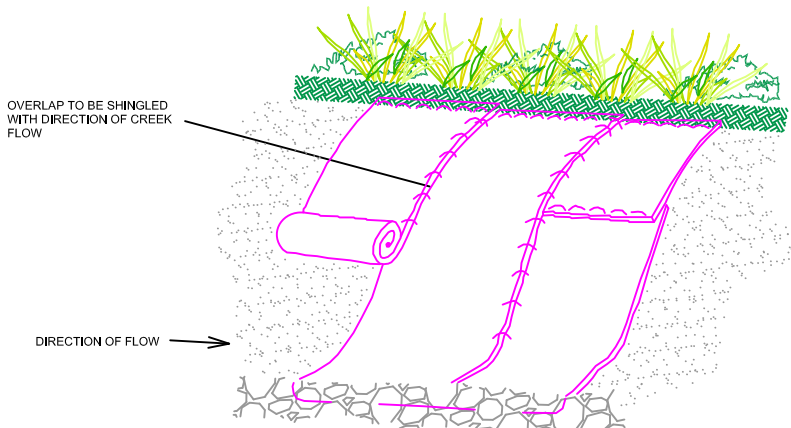




**1**  
**4**

**SOIL EROSION CONTROL  
GEOTEXTILE SILT FENCE**

NO SCALE

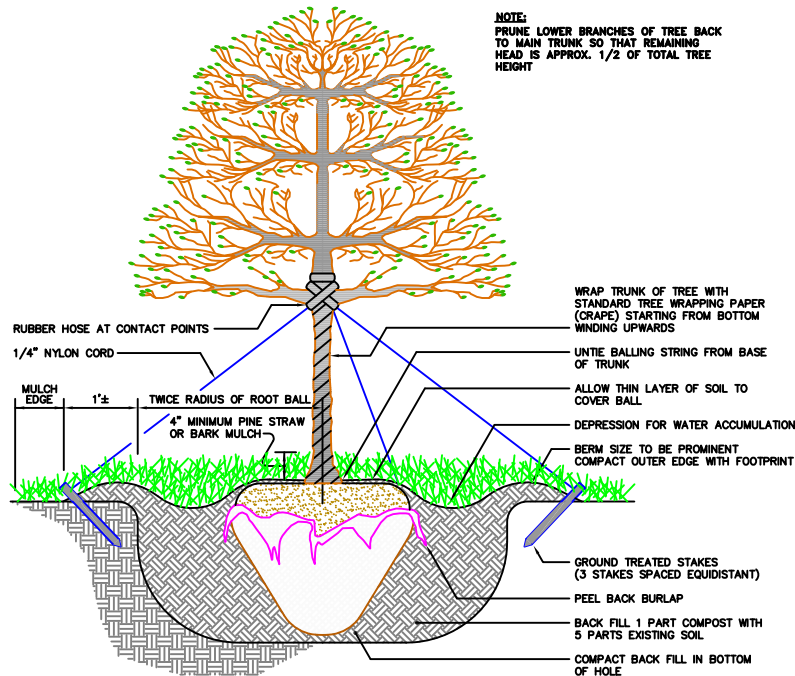


**2**  
**4**

**EROSION CONTROL BLANKET DETAIL**

NO SCALE

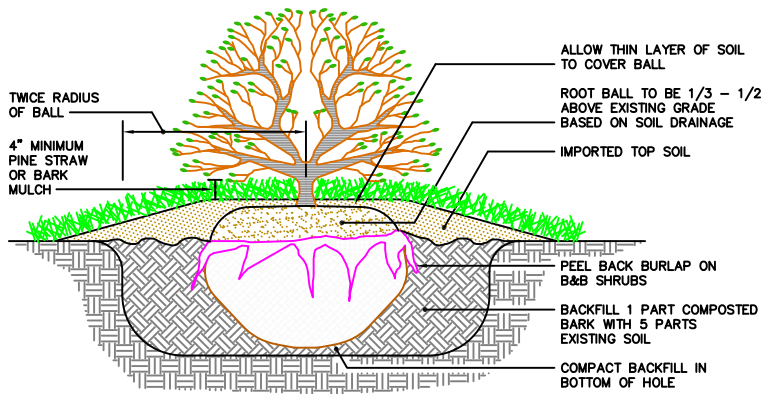
- NOTES:**
1. PREPARE SOIL BEFORE INSTALLING BLANKETS, INCLUDING APPLICATION OF FERTILIZER AND SEED.
  2. BEGIN AT THE TOP OF THE SLOPE BY ANCHORING THE BLANKET IN A 6" DEEP BY 6" WIDE TRENCH. BACKFILL AND COMPACT THE TRENCH AFTER PINNING.
  3. ROLL THE BLANKETS DOWN THE SLOPE IN THE DIRECTION OF THE WATER FLOW.
  4. THE EDGES OF PARALLEL BLANKETS MUST BE PINNED WITH APPROXIMATELY 2" OVERLAP.
  5. WHEN BLANKETS MUST BE SPICED DOWN THE SLOPE, PLACE BLANKETS END OVER END (SHINGLE STYLE) WITH APPROXIMATELY 6" OVERLAP. STAPLE THROUGH OVERLAPPED AREA, APPROXIMATELY 12" APART.
  6. BLANKETS SHALL BE PINNED IN ROWS NOT MORE THAN 2 FT O.C. WITH A MAXIMUM OF 20" BETWEEN PINS, 3.5 PINS PER SQ YD.
  7. LOWER END OF BLANKET TO BE TUCKED 6" MIN. BELOW EDGE OF TOE.



**3**  
**4**

**STAKING AND PLANTING  
TREE DETAIL**

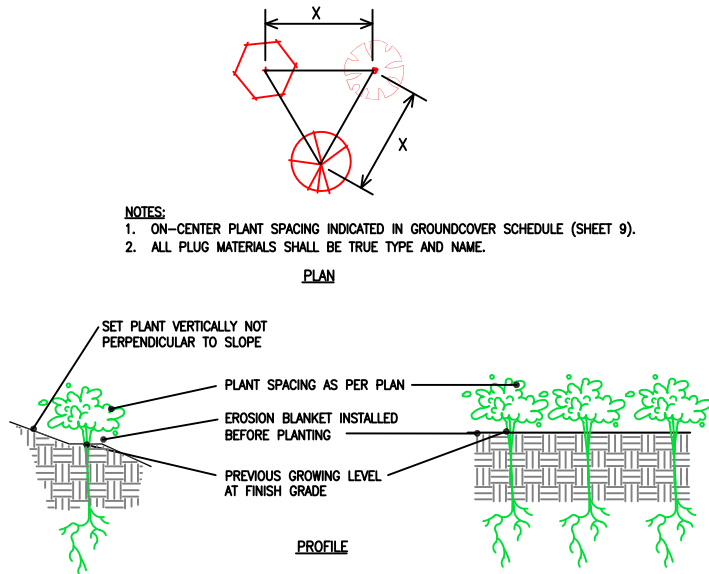
NO SCALE



**4**  
**4**

**SHRUB DETAIL  
CONTAINER AND B&B**

NO SCALE



**5**  
**4**

**PLANTING**

GROUNDCOVER - NO SCALE

SA-7 VEGETATION

PART 1.        GENERAL

1.01    SECTION INCLUDES

- A.    Preparation of grades to receive seeding and vegetation.
- B.    Seeding and fertilizing.
- C.    Seed protection on slopes.
- D.    Hydroseeding.
- E.    Planting special seed mixes
  - 1.    WP-3 (Midwestern Wet Prairie Seed Mix)
- F.    Maintenance and Warranty.

1.02    SUBMITTALS

- A.    Documentation must include the following:
  - 1.    Submit seed tags to Engineer prior to seeding.
  - 2.    Submit copy of invoice to media amendment.

1.03    QUALITY ASSURANCE

- A.    Grass seed shall meet the tolerance for germination and purity of the Official Seed Analyses of North America.

1.04    PRODUCT DELIVERY, STORAGE, AND HANDLING

- A.    Deliver seed in original containers showing analysis of seed mixture, percentage of pure seed, year of production, net weight, date of testing, and location of packaging. Damaged packages are not acceptable.
- B.    Deliver fertilizer in waterproof bags showing weight, chemical analysis, and name of manufacturer.

1.05    EXISTING CONDITIONS

- A.    Beginning work means acceptance of existing conditions.

PART 2.        PRODUCTS

2.01    GROWING MEDIA

- A.    Topsoil
  - 1.    Existing topsoil shall be re-used.
  - 2.    Import additional topsoil as needed.
- B.    Water
  - 1.    To be furnished by the Contractor. Portage Creek is an acceptable source.

2.02    SEED

- A.    Seed shall be new crop, cleaned, and comprising of the following varieties mixed in proportion by weight shown and testing the minimum percentages and germination indicated as follows:

2.03    SEED MIXTURE

- A.    Type "A" Seed Mixture (Repair of General Lawn Areas)

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**KIESER & ASSOCIATES, LLC**

- 25 %    Famous Kentucky Bluegrass
- 25%    Baron Kentucky Bluegrass
- 20%    Secretariat Perennial Ryegrass
- 30%    Boreal Creeping Red Fescue

B.    All special native seed mixes shall be purchased from the following supplier:

- 1) **Heartland Restoration Services, Inc.**                      **Contact:** Eric Ummel  
14921 Hand Road  
Fort Wayne, Indiana 46818  
Ph: (260) 489-8511  
Fx: (260) 489-8607  
Email: mail@carthsourcecinc.net

Trees, shrubs and plugs (refer to tree/shrub schedule on the drawings) shall be purchased from the following supplier(s) to the extent possible (as current stock allows):

- 2) **Wildtype Native Plant Nursery**                                      **Contact:** Bill Schneider  
900 N. Every Road  
Mason, MI 48854  
Ph: (517) 244-1140  
Fax: (517) 244-1142  
E-mail: [wildtype@msu.edu](mailto:wildtype@msu.edu)

- 3) **Hidden Savanna Nursery**    **Contact:** Chad Hughson  
18 N Van Kal Street  
Kalamazoo, MI 49009  
Ph: (269)352-3876  
Email: [info@hiddensavanna.com](mailto:info@hiddensavanna.com)

- 4) **American Roots**    **Contact:** Trish Hacker-Henning  
1958 Hidden Lake Trail  
Ortonville, MI 48462  
Ph: (248) 627-8525 or (248) 882-7768  
Fax: (248) 627-3865  
Email: [americanrootsnat@aol.com](mailto:americanrootsnat@aol.com)

- 5) **Sandhill Farm**    **Contact:** Cheryl Tolley  
11250 10 Mile Road  
Rockford, MI 49341-7954  
Ph: (616) 691-8214  
Fax: (616) 691-7872  
Email: [cheryl@iserv.net](mailto:cheryl@iserv.net)

- 6) **Mary Ann's Michigan Trees & Shrubs**                                      **Contact:** Mary Ann Menck  
28092 M-40 Hwy.  
Paw Paw, MI 49079  
Phone: (269) 628-2474  
Email: [mamenck@mei.net](mailto:mamenck@mei.net)

Portage Creek Area Time Critical Removal Action  
EQM Project Number: 030281.0087  
Specifications 02920

**KIESER & ASSOCIATES, LLC**



C. Special Native Seed Mixes

1) **Midwestern Wet Prairie Seed Mix (WP3)**

Approximate mix weight 39 lb/acre, with 76 native seeds/sq. ft.  
45.9% Grasses/Sedges/Rushes; 42.9%, Forbs; 11.2% Temporary Cover Grasses

Scientific Name	Common Name
<i>Grasses, Sedges, and Rushes</i>	
Andropogon gerardii	Big Bluestem
Calamagrostis canadensis	Blue Joint Grass
Carex granularis	Meadow Sedge
Carex normalis	Spreading Oval Sedge
Carex shortiana	Short's Sedge
Carex stipata	Stalk Grain Sedge
Carex vulpinoidea	Fox Sedge
Elymus canadensis	Canada Wild Rye
Elymus virginicus	Virginia Wild Rye
Juncus effusus	Soft Rush
Panicum virgatum	Switch Grass
Scirpus atrovirens	Dark Green Bulrush
Scirpus cyperinus	Woolgrass
Scirpus pendulus	Drooping Bulrush
Spartina pectinata	Prairie Cord Grass
<i>Forbs</i>	
Asclepias incarnata	Marsh Milkweed
Aster firmus	Swamp Aster
Aster novae-angliae	New England Aster
Aster umbellatus	Flat-top White Aster
Eupatorium maculatum	Spotted Joe Pye Weed
Eupatorium perfoliatum	Common Boneset
Gentiana andrewsii	Fringe-top Bottle Gentian
Helenium autumnale	Common Sneezeweed
Liatris spicata	Spiked Gayfeather
Lobelia cardinalis	Cardinal Flower
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Penstemon digitalis	Foxglove Beard Tongue
Pycnanthemum virginianum	Mountain Mint
Rudbeckia fulgida	Showy Black-eyed Susan
Rudbeckia triloba	Brown-eyed Susan
Senna hebecarpa	Wild Senna
Silphium perfoliatum	Cup Plant
Solidago riddellii	Riddell's Goldenrod
Tradescantia ohimensis	Ohio Spiderwort
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Zizia aurea	Golden Alexanders

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**Price and Company, Inc.**  
425 36<sup>th</sup> Street SW

Wyoming, MI 49548  
Ph: (616) 530-8230  
Fx: (616) 530-2317

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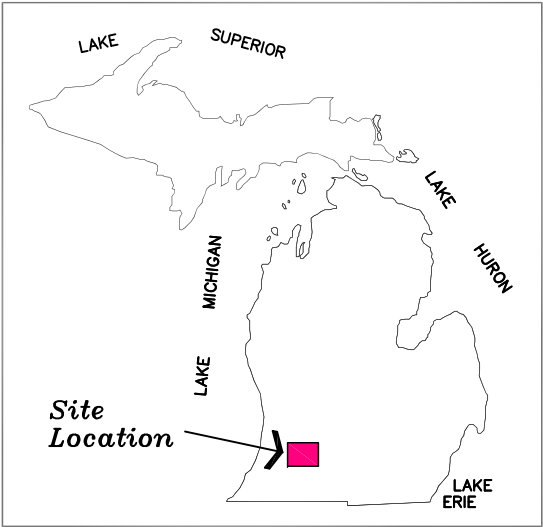
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Environmental Quality Management  
18000 Carillon Boulevard  
Cincinnati, OH 45240  
(513)-265-8875  
Mr. Eric Bowman

CONSULTANT CONTACT  
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536 E. Mich. Ave, Ste 300  
Kalamazoo, MI 49007  
(269) 344-7117  
Mr. Brian Boyer, P.E.



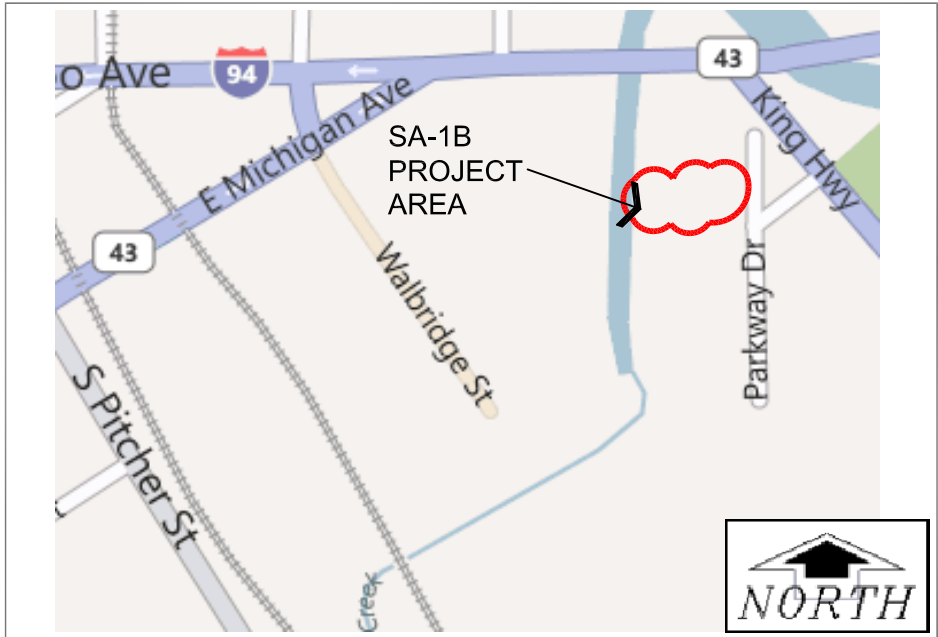
KALAMAZOO COUNTY, MICHIGAN



# PORTAGE CREEK TIME CRITICAL REMOVAL ACTION KALAMAZOO, MICHIGAN

EQM PROJECT NUMBER 030281.0087

PORTAGE CREEK - SITE SA-1B



SITE LOCATION MAP

INDEX OF DRAWING SHEETS	
1	Cover Sheet
2	Site SA-1B Vegetation Plan
3	Detail Drawings
4-6	Specifications

CITY OF KALAMAZOO  
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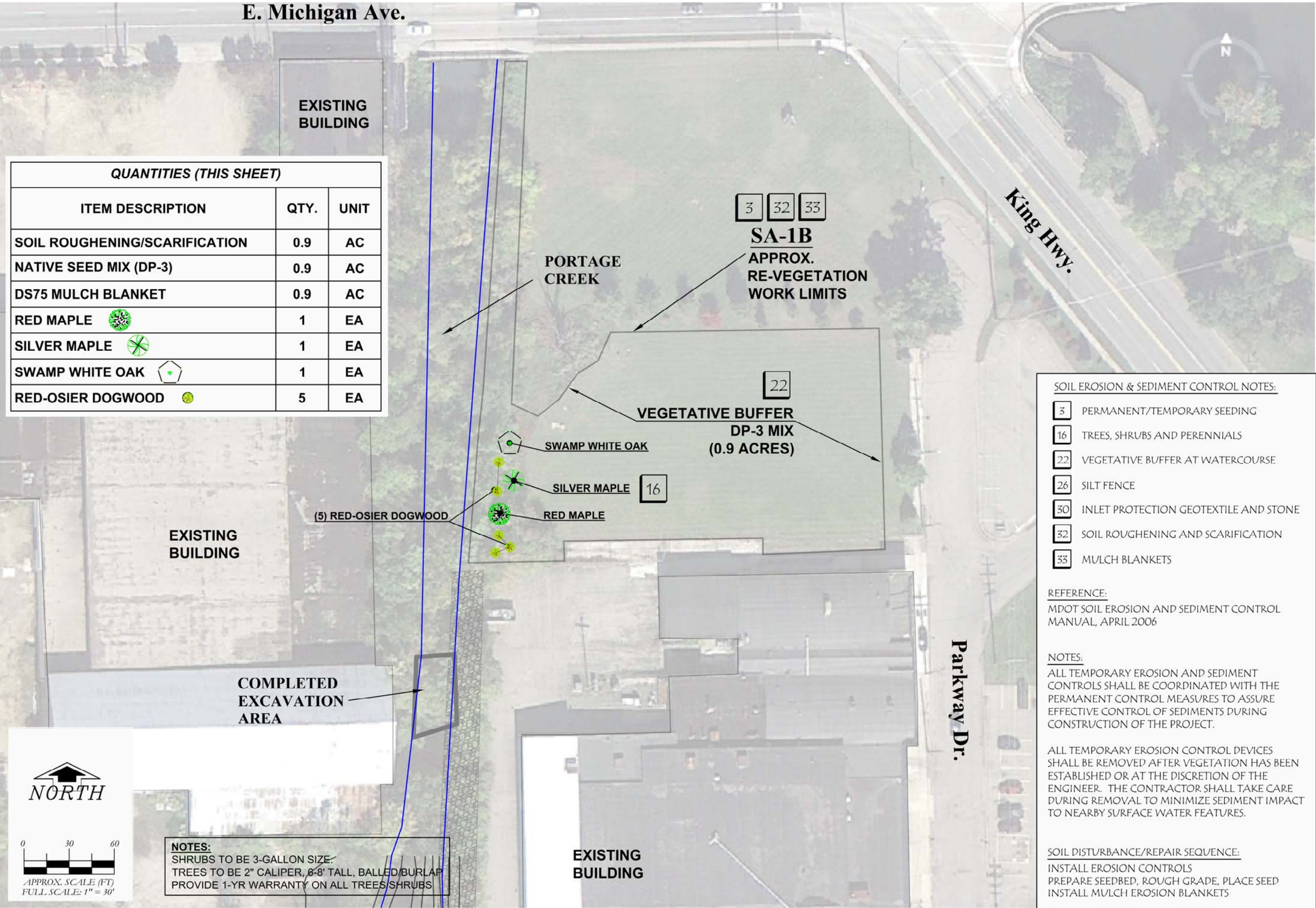
## EROSION CONTROLS

1. ALL CONSTRUCTION SHALL COMPLY WITH THE SOIL EROSION AND SEDIMENTATION CONTROL ACT (P.A. 347 OF 1972, AS AMENDED).
2. ALL TEMPORARY EROSION CONTROLS SHALL BE REMOVED ONCE CONSTRUCTION IS COMPLETE.
3. TEMPORARY EROSION CONTROL MEASURES SHALL BE INSTALLED PRIOR TO COMMENCING WORK, TO THE EXTENT POSSIBLE.
4. CONTRACTOR TO PROTECT ONSITE CATCH BASINS FROM DAMAGE AND SEDIMENTATION.
5. ENSURE PROPER DRAINAGE FOLLOWING BACKFILL.
6. CONTRACTOR SHALL MONITOR AND MAINTAIN ALL SOIL EROSION CONTROL MEASURES FOR THE DURATION OF THE CONSTRUCTION PERIOD.
7. SUPPLEMENTAL SOIL EROSION CONTROLS SHALL BE INSTALLED AS NEEDED TO ENSURE

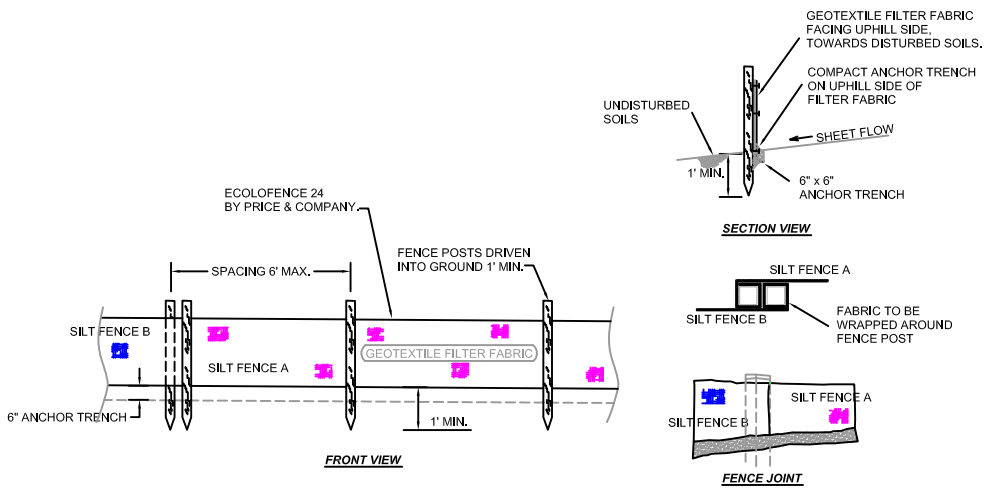
## GENERAL NOTES:

1. The Contractor is responsible for contacting MISS DIG (1-800-482-7171) at least 3 working days before construction begins. The Contractor shall provide the MISS DIG ticket number upon request. Any utility conflicts must be presented to the Engineer in writing prior to commencement of work.
2. With EPA oversight, Contractor is not required to obtain permits for re-vegetation work.
3. The Contractor is responsible for knowing and following all appropriate safety standards which are required by the Michigan Occupational Safety and Health Act.
4. Hard hats must be worn by anyone on the site who may be exposed to falling objects or flying debris and anyone within the operating range of overhead construction equipment. This equipment includes, but is not limited to, backhoes, cranes, draglines, and front end loaders.
5. Any deviation from these construction drawings and specifications will be considered defective work, subject to modification for conformance at the Contractor's expense.
6. Contractor shall keep disturbance of all areas of construction to a minimum.
7. Locations and elevations of existing utilities are not exact. Contact Miss Dig at 1-800-482-7171, prior to beginning construction.
8. Existing utilities destroyed or disturbed by the Contractor's operations shall be repaired at the Contractor's expense.
9. Hand dig in all areas of existing utilities.
10. The contractor shall be required to prevent movement of soil off site. Additional silt fencing may be required beyond that already on-site. Any additional silt fencing shall be incidental to work.
11. All work shall be checked for accuracy to the plans by the Contractor prior to installation.

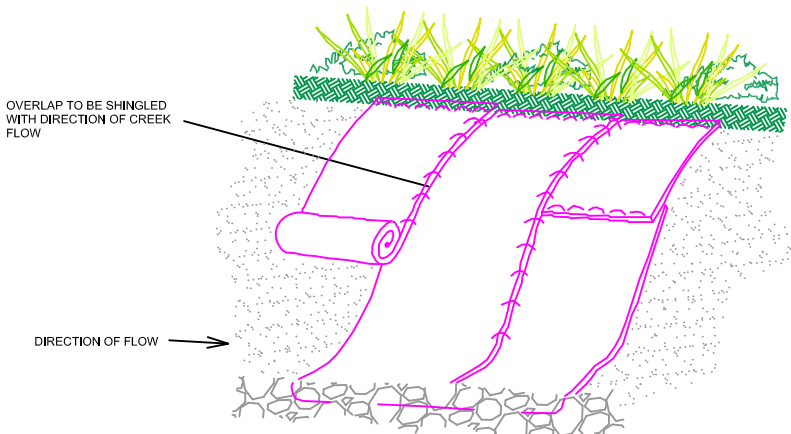






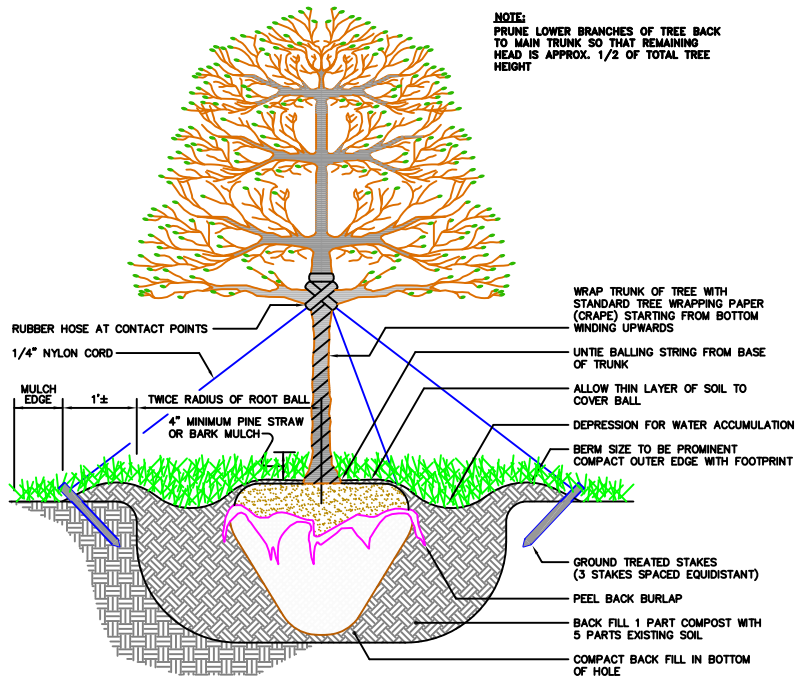


1 SOIL EROSION CONTROL  
GEOTEXTILE SILT FENCE  
NO SCALE

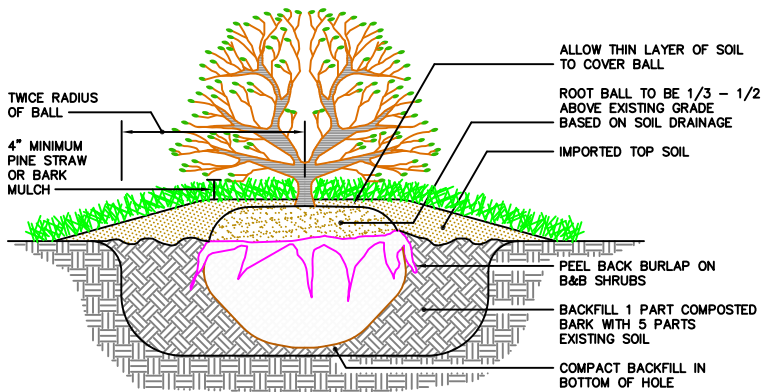


2 EROSION CONTROL BLANKET DETAIL  
NO SCALE

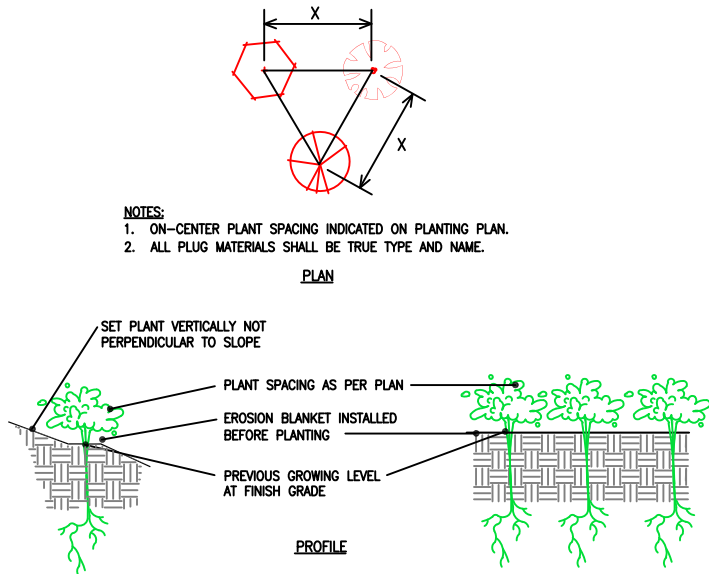
- NOTES:**
1. PREPARE SOIL BEFORE INSTALLING BLANKETS, INCLUDING APPLICATION OF SEED.
  2. BEGIN AT THE TOP OF THE SLOPE BY ANCHORING THE BLANKET IN A 6" DEEP BY 6" WIDE TRENCH. BACKFILL AND COMPACT THE TRENCH AFTER PINNING.
  3. ROLL THE BLANKETS DOWN THE SLOPE IN THE DIRECTION OF THE WATER FLOW.
  4. THE EDGES OF PARALLEL BLANKETS MUST BE PINNED WITH APPROXIMATELY 2" OVERLAP.
  5. WHEN BLANKETS MUST BE SPICED DOWN THE SLOPE, PLACE BLANKETS END OVER END (SHINGLE STYLE) WITH APPROXIMATELY 6" OVERLAP. STAPLE THROUGH OVERLAPPED AREA, APPROXIMATELY 12" APART.
  6. BLANKETS SHALL BE PINNED IN ROWS NOT MORE THAN 2 FT O.C. WITH A MAXIMUM OF 20" BETWEEN PINS, 3.5 PINS PER SQ YD.
  7. LOWER END OF BLANKET TO BE TUCKED 6" MIN. BELOW EDGE OF TOE.



3 STAKING AND PLANTING  
TREE DETAIL  
NO SCALE



4 SHRUB DETAIL  
CONTAINER AND B&B  
NO SCALE



5 PLANTING  
GROUND COVER - NO SCALE

SA-1B VEGETATION

PART 1.      GENERAL

1.01    SECTION INCLUDES

- A.    Preparation of grades to receive seeding and vegetation.
- B.    Seeding.
- C.    Seed protection on slopes.
- D.    Planting special seed mixes.
  - 1.    **DP-3** (Short Stature Prairie Seed Mix)
- E.    Maintenance and Warranty.

1.02    SUBMITTALS

- A.    Documentation must include the following:
  - 1.    Submit seed tags to Engineer prior to seeding.
  - 2.    Submit copy of invoice to media amendment.

1.03    QUALITY ASSURANCE

- A.    Grass seed shall meet the tolerance for germination and purity of the Official Seed Analyses of North America.

1.04    PRODUCT DELIVERY, STORAGE, AND HANDLING

- A.    Deliver seed in original containers showing analysis of seed mixture, percentage of pure seed, year of production, net weight, date of testing, and location of packaging. Damaged packages are not acceptable.

1.05    EXISTING CONDITIONS

- A.    Beginning work means acceptance of existing conditions.

PART 2.      PRODUCTS

2.01    GROWING MEDIA

- A.    Topsoil
  - 1.    Existing topsoil shall be re-used.
  - 2.    Import additional topsoil as needed to minimize weed seed viability.
- B.    Water
  - 1.    To be furnished by the Contractor. Portage Creek is an acceptable source.

2.02    SEED

- A.    Seed shall be new crop, cleaned, and comprising of the following varieties mixed in proportion by weight shown and testing the minimum percentages and germination indicated as follows:

2.03    SEED MIXTURE

- A.    All special native seed mixes shall be purchased from the following supplier:

1) **Heartland Restoration Services, Inc.**      **Contact:** Eric Ummel  
14921 Hand Road  
Fort Wayne, Indiana 46818  
Ph: (260) 489-8511  
Fx: (260) 489-8607  
Email: mail@earthsourceinc.net

Trees, shrubs and plugs (refer to tree/shrub schedule on the drawings) shall be purchased from the following supplier(s) to the extent possible (as current stock allows):

2) **Wildtype Native Plant Nursery**      **Contact:** Bill Schneider  
900 N. Every Road  
Mason, MI 48854  
Ph: (517) 244-1140  
Fax: (517) 244-1142  
E-mail: [wildtype@msu.edu](mailto:wildtype@msu.edu)

3) **Hidden Savanna Nursery**      **Contact:** Chad Hughson  
18 N Van Kal Street  
Kalamazoo, MI 49009  
Ph: (269)352-3876  
Email: [info@hiddensavanna.com](mailto:info@hiddensavanna.com)

4) **American Roots**      **Contact:** Trish Hacker-Henning  
1958 Hidden Lake Trail  
Ortonville, MI 48462  
Ph: (248) 627-8525 or (248) 882-7768  
Fax: (248) 627-3865  
Email: [americanrootsnat@aol.com](mailto:americanrootsnat@aol.com)

5) **Sandhill Farm**      **Contact:** Cheryl Tolley  
11250 10 Mile Road  
Rockford, MI 49341-7954  
Ph: (616) 691-8214  
Fax: (616) 691-7872  
Email: [cherylt@iserv.net](mailto:cherylt@iserv.net)

6) **Native Landscapes**      **Contact:** Randy Counterman  
28092 M-40 Hwy.  
Paw Paw, MI 49079  
Phone: 269-929-3455  
Email: [randy.counterman@gmail.com](mailto:randy.counterman@gmail.com)





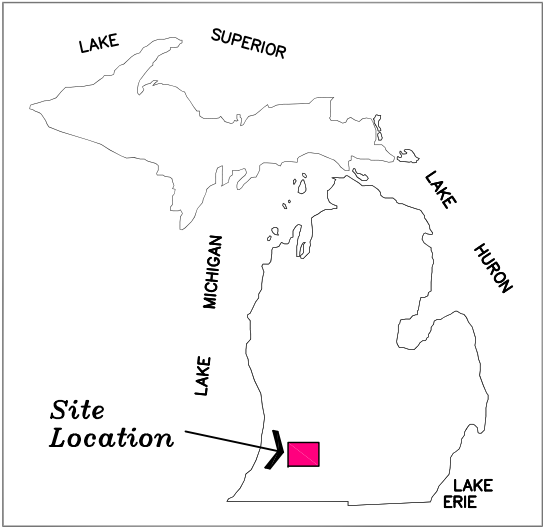
- D. Minimum Erosion Control Products (as specified on the drawings).
    - 1. Straw Single Net Erosion Blankets (100% biodegradable).
    - 2. TerraTex HPG-44 Geotextile Fabric
    - 3. Ecolofence 24" Silt Fence
  - E. Additional erosion control measures shall be implemented as required to minimize silt or sediment leaving the construction site. The Contractor shall monitor and maintain all erosion control devices throughout the duration of the construction period.
  - F. All temporary erosion control devices should be in place prior to the start of construction/excavation activities, to the extent possible. The Contractor shall remove all temporary erosion control devices once full vegetation has been established.
- 3.04 MAINTENANCE
- A. Maintenance responsibilities begin immediately upon completion of seeding and planting, and shall continue for a period of 1-year. All wind, water, fire, vandalism, or natural damage that occurs during this time frame shall be repaired by the Contractor within 5 days of being notified by EQM at no additional cost to the project. Repairs shall be completed in a manner that meets the requirements of these specifications.
- 3.05 GUARANTEE
- A. It is the responsibility of the Contractor to establish and maintain a dense growth of vegetation, for a period of 1-year. All trees and shrubs shall be provided with a minimum 1-year warrantee. Institute measures to protect completed landscape areas. Any part of the area that fails to show a uniform germination shall be re-seeded and such re-seeding shall continue until a dense growth is established. The Contractor shall repair damage to seeded areas resulting from erosion and/or overwatering.
  - B. Replace dead or unhealthy plants with plants of the same size and species as specified. Species substitutions will not be allowed without engineer approval.

END OF SPECIFICATIONS



EQM CONTACT  
Environmental Quality Management  
18000 Carillon Boulevard  
Cincinnati, OH 45240  
(513)-265-8875  
Mr. Eric Bowman

CONSULTANT CONTACT  
KIESER & ASSOCIATES, LLC  
536 E. Mich. Ave, Ste 300  
Kalamazoo, MI 49007  
(269) 344-7117  
Mr. Brian Boyer, P.E.

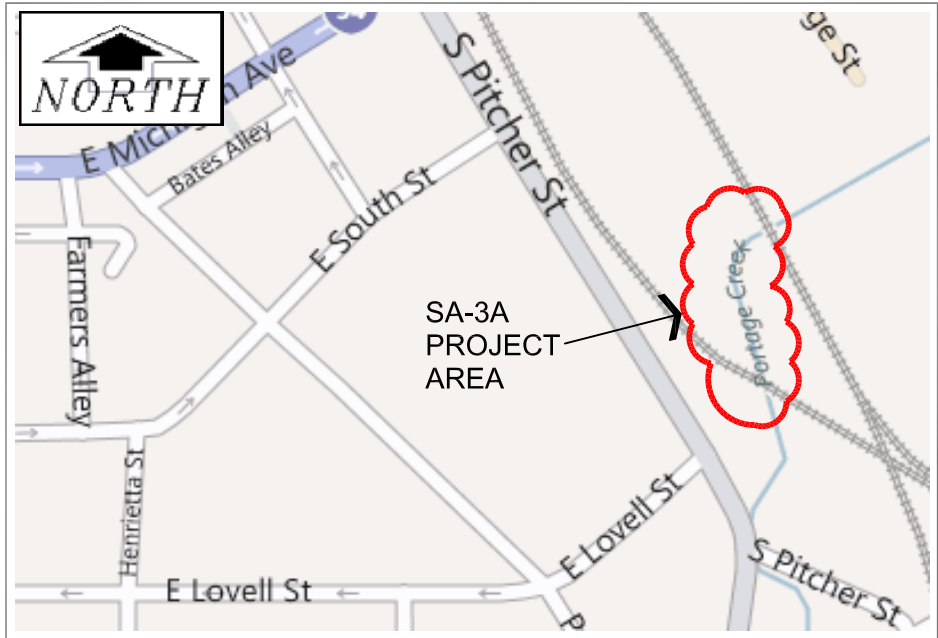


KALAMAZOO COUNTY, MICHIGAN



# PORTAGE CREEK TIME CRITICAL REMOVAL ACTION KALAMAZOO, MICHIGAN

EQM PROJECT NUMBER 030281.0087  
PORTAGE CREEK - SITE SA-3A



SITE LOCATION MAP

INDEX OF DRAWING SHEETS	
1	Cover Sheet
2	Site SA-3A Vegetation Plan
3	Detail Drawings
4-7	Specifications

CITY OF KALAMAZOO  
<http://www.kalamazoo.org/onlinegis/CXviewer.htm>  
T2s R11w, SE 1/4 of Section 22  
in Kalamazoo County, Michigan.



Know what's below.  
Call before you dig.  
1-800-482-7171

NOTES:  
ALL EXISTING UTILITY LOCATIONS DEPICTED ON THESE PLANS ARE APPROXIMATE; BASED ON AVAILABLE INFORMATION AND FIELD OBSERVATIONS BY OTHERS. AS A RESULT, UTILITY LOCATIONS SHOWN ARE NOT EXACT. DO NOT ASSUME THESE ARE THE ONLY UTILITIES PRESENT.

NOTE TO CONTRACTOR:  
3 FULL WORKING DAYS BEFORE YOU DIG, CALL "MISS DIG".

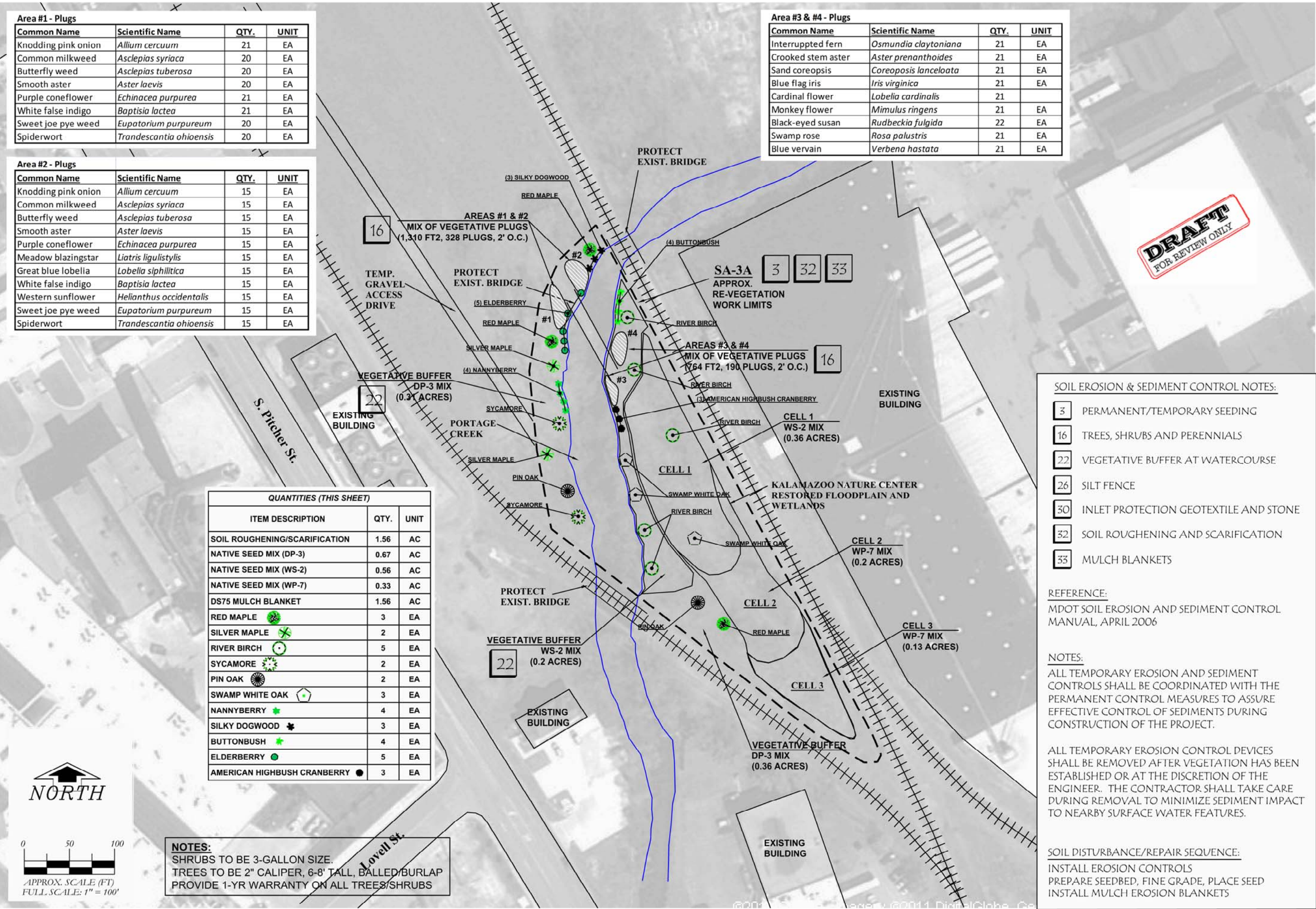
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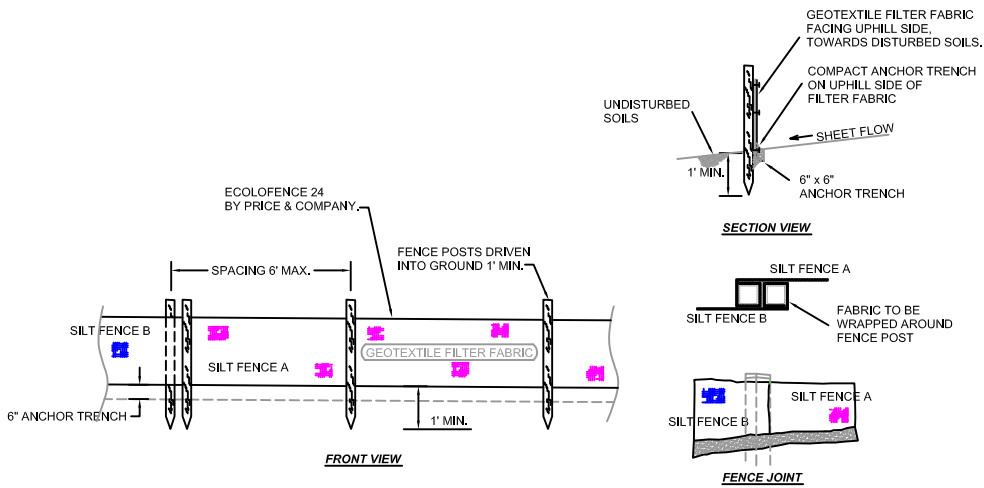
## GENERAL NOTES:

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2. No permitting is required for conducting re-vegetation work.
3. The Contractor is responsible for knowing and following all appropriate safety standards which are required by the Michigan Occupational Safety and Health Act.
4. Hard hats must be worn by anyone on the site who may be exposed to falling objects or flying debris and anyone within the operating range of overhead construction equipment. This equipment includes, but is not limited to, backhoes, cranes, draglines, and front end loaders.
5. Any deviation from these construction drawings and specifications will be considered defective work, subject to modification for conformance at the Contractor's expense.
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8. Existing utilities destroyed or disturbed by the Contractor's operations shall be repaired at the Contractor's expense.
9. Hand dig in all areas of existing utilities.
10. The contractor shall be required to prevent movement of soil off site. Additional silt fencing may be required beyond that already on-site. Any additional silt fencing shall be incidental to work.
11. All work shall be checked for accuracy to the plans by the Contractor prior to installation.





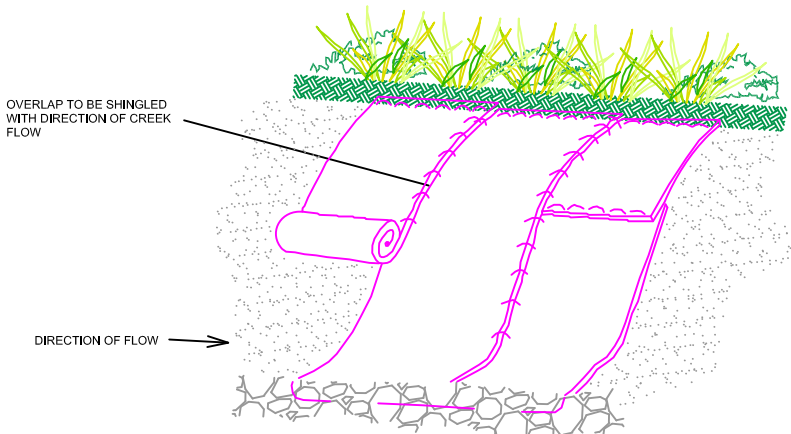




1  
3

SOIL EROSION CONTROL  
GEOTEXTILE SILT FENCE

NO SCALE

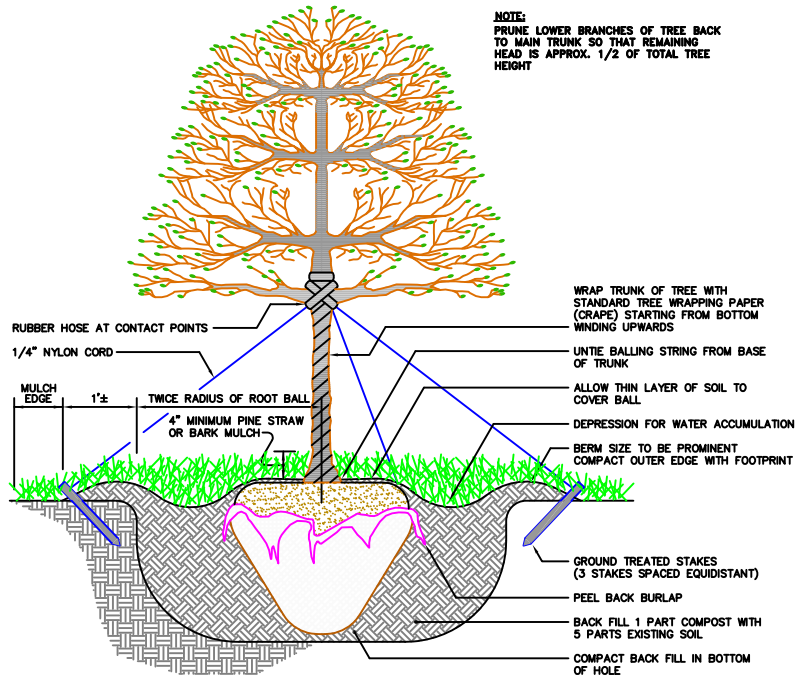


2  
3

EROSION CONTROL BLANKET DETAIL

NO SCALE

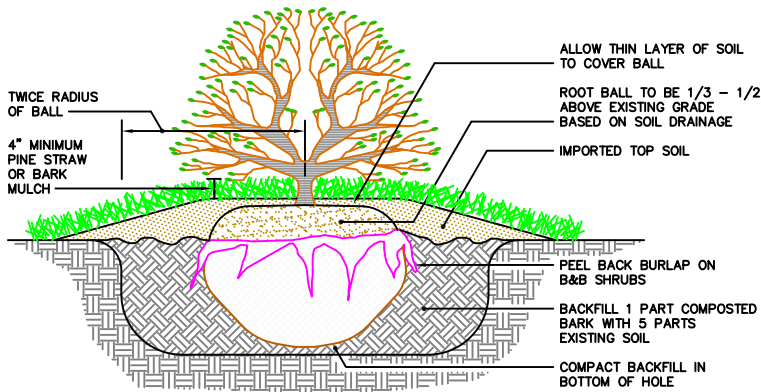
- NOTES:**
1. PREPARE SOIL BEFORE INSTALLING BLANKETS, INCLUDING APPLICATION OF FERTILIZER AND SEED.
  2. BEGIN AT THE TOP OF THE SLOPE BY ANCHORING THE BLANKET IN A 6" DEEP BY 6" WIDE TRENCH. BACKFILL AND COMPACT THE TRENCH AFTER PINNING.
  3. ROLL THE BLANKETS DOWN THE SLOPE IN THE DIRECTION OF THE WATER FLOW.
  4. THE EDGES OF PARALLEL BLANKETS MUST BE PINNED WITH APPROXIMATELY 2" OVERLAP.
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  7. LOWER END OF BLANKET TO BE TUCKED 6" MIN. BELOW EDGE OF TOE.



3  
3

STAKING AND PLANTING  
TREE DETAIL

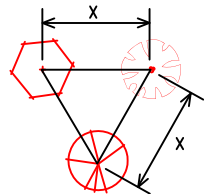
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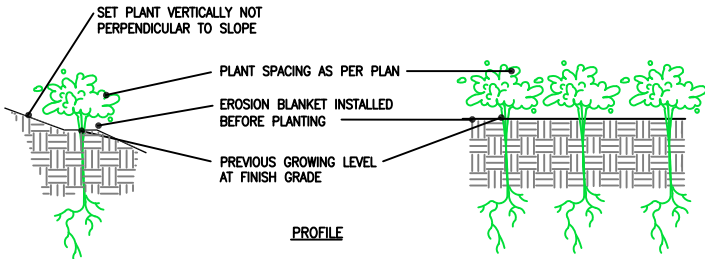
4  
3

SHRUB DETAIL  
CONTAINER AND B&B

NO SCALE



- NOTES:**
1. ON-CENTER PLANT SPACING INDICATED IN GROUNDCOVER SCHEDULE (SHEET 9).
  2. ALL PLUG MATERIALS SHALL BE TRUE TYPE AND NAME.



5  
3

PLANTING  
GROUNDCOVER - NO SCALE

### SA-3A VEGETATION

**PART I. GENERAL**

**1.01 SECTION INCLUDES**

- A. Preparation of grades to receive seeding and vegetation.
- B. Seeding and fertilizing.
- C. Seed protection on slopes.
- D. Hydroseeding.
- E. Planting special seed mixes
  - 1. **DP-3** (Short Stature Prairie Seed Mix)
  - 2. **WS-2** (Riparian Mix)
  - 3. **WP-7** (Short Stature Bioswale Mix)
- F. Maintenance and Warranty.

## 1.02 SUBMITTALS

- A. Documentation must include the following:**
- 1. Submit seed tags to Engineer prior to seeding.**
  - 2. Submit copy of invoice to media amendment.**

### 1.03 QUALITY ASSURANCE

- A. Grass seed shall meet the tolerance for germination and purity of the Official Seed Analyses of North America.

#### 1.04 PRODUCT DELIVERY, STORAGE, AND HANDLING

- A. Deliver seed in original containers showing analysis of seed mixture, percentage of pure seed, year of production, net weight, date of testing, and location of packaging. Damaged packages are not acceptable.
- B. Deliver fertilizer in waterproof bags showing weight, chemical analysis, and name of manufacturer.

## 1.05 EXISTING CONDITIONS

- A. Beginning work means acceptance of existing conditions.

## PART 2. PRODUCTS

## 2.01 GROWING MEDIA

- A. Topsoil
1. Existing topsoil shall be re-used.
  2. Import additional topsoil as needed.
- B. Water
1. To be furnished by the Contractor. Portage Creek is an acceptable source.

## 2.02 SEED

- A. Seed shall be new crop, cleaned, and comprising of the following varieties mixed in proportion by weight shown and testing the minimum percentages and germination indicated as follows:

## 2.03 SEED MIXTURE

- A. Type "A" Seed Mixture (Repair of General Lawn Areas)
- |      |                                |
|------|--------------------------------|
| 25 % | Famous Kentucky Bluegrass      |
| 25%  | Baron Kentucky Bluegrass       |
| 20%  | Secretariat Perennial Ryegrass |
| 30%  | Boreal Creeping Red Fescue     |
- B. All special native seed mixes shall be purchased from the following supplier:
- 1) **Heartland Restoration Services, Inc.** **Contact:** Eric Ummel  
14921 Hand Road  
Fort Wayne, Indiana 46818  
Ph: (260) 489-8511  
Fx: (260) 489-8607  
Email: mail@earthsoureceinc.net

Trees, shrubs and plugs (refer to tree/shrub schedule on the drawings) shall be purchased from the following supplier(s) to the extent possible (as current stock allows):

- 2) Wildtype Native Plant Nursery** **Contact: Bill Schneider**  
 900 N. Every Road  
 Mason, MI 48854  
 Ph: (517) 244-1140  
 Fax: (517) 244-1142  
 E-mail: [wildtype@msu.edu](mailto:wildtype@msu.edu)

- 3) Hidden Savanna Nursery**  
18 N Van Kal Street  
Kalamazoo, MI 49009  
Ph: (269)352-3876  
Email: [info@hiddensavanna.com](mailto:info@hiddensavanna.com)

- 4) American Roots**  
1958 Hidden Lake Trail  
Ortonville, MI 48462  
Ph: (248) 627-8525 or (248) 882-7768  
Fax: (248) 627-3865  
Email: [americanrootsnat@aol.com](mailto:americanrootsnat@aol.com)

- 5) Sandhill Farm**  
11250 10 Mile Road  
Rockford, MI 49341-7954  
Ph: (616) 691-8214  
Fax: (616) 691-7872  
Email: [cheryl@iserv.net](mailto:cheryl@iserv.net)



6) Mary Ann’s Michigan Trees & Shrubs
Contact: Mary Ann Menck
28092 M-40 Hwy.
Paw Paw, MI 49079
Phone: (269) 628-2474
Email: [mamcnck@mci.net](mailto:mamcnck@mci.net)

C. Special Native Seed Mixes

1) **Midwestern Short Stature Prairie Seed Mix (DP-3)**

Approximate mix weight 43 lb/acre with 74 native seeds/sq.ft.  
44.4% Grasses/Sedges/Rushes; 44.1% Forbs; 11.4% Temporary Cover Grasses

Scientific Name	Common Name
<i>Grasses, Sedges, and Rushes</i>	
Bouteloua curtipendula	Side Oats Grama
Carex bicknellii	Bicknell's Sedge
Elymus virginicus	Virginia Wild Rye
Schizachyrium scoparium	Little Bluestem
Sporobolus heterolepis	Prairie Dropseed

<i>Forbs</i>	
Asclepias syriaca	Common Milkweed
Asclepias tuberosa	Butterfly Milkweed
Aster ericoides	White Heath Aster
Coreopsis lanceolata	Sand Coreopsis
Coreopsis palmata	Prairie Coreopsis
Echinacea purpurea	Purple Coneflower
Gentiana andrewsii	Fringe-top Bottle Gentian
Helianthus occidentalis	Few-leaf Sunflower
Lespedeza capitata	Round-headed Bushclover
Liatris aspera	Rough Blazingstar
Liatris scariosa nieuwlandii	Savanna Blazingstar
Lupinus perennis	Wild Blue Lupine
Parthenium integrifolium	Wild Quinine
Penstemon digitalis	Foxglove Beard Tongue
Petalostemum purpureum	Purple Prairie Clover
Potentilla arguta	Tall Cinquefoil
Pycnanthemum virginianum	Mountain Mint
Rudbeckia fulgida	Showy Black-eyed Susan
Rudbeckia hirta	Black-eyed Susan
Solidago nemoralis	Gray Goldenrod
Tradescantia ohnensis	Ohio Spiderwort
Verbena stricta	Hoary Vervain
Zizia aurea	Golden Alexanders

<i>Temporary Cover Grasses</i>	
Avena sativa	Seed Oats

2) **Midwestern Riparian Seed Mix (WS-2)**

Approximate mix weight 73 lb/acre with 46 native seeds/sq. ft.  
13.9% Grasses/Sedges/Rushes; 5.4% Forbs; 80.7% Temporary Cover Grasses

Scientific Name	Common Name
<i>Grasses, Sedges, and Rushes</i>	
Carex frankii	Frank's Sedge
Carex muskingumensis	Palm Sedge
Carex normalis	Spreading Oval Sedge
Carex squarrosa	Squarrose Sedge
Carex vulpinoidea	Fox Sedge
Ciuna arundinacea	Common Wood Reed
Elymus canadensis	Canada Wild Rye
Elymus riparius	Riverbank Wild Rye
Elymus virginicus	Virginia Wild Rye
Glyceria striata	Fowl Manna Grass
Leersia oryzoides	Rice Cut Grass
Panicum virgatum	Switch Grass
Scirpus atrovirens	Dark Green Bulrush
Scirpus pendulus	Drooping Bulrush

<i>Forbs</i>	
Aster novae-angliae	New England Aster
Bidens cernua	Nodding Bur Marigold
Eupatorium purpureum	Purple Joe Pye Weed
Eupatorium rugosum	White Snakeroot
Helioopsis helianthoides	False Sunflower
Lysimachia ciliata	Fringed Loosestrife
Rudbeckia laciniata	Green-headed Coneflower
Rudbeckia triloba	Brown-eyed Susan
Silphium perfoliatum	Cup Plant
Verbesina alternifolia	Wingstem
Vernonia gigantea	Tall Ironweed
Zizia aurea	Golden Alexanders

<i>Temporary Cover Grasses</i>	
Agrostis alba	Redtop
Agrostis alba palustris	Creeping Bent Grass
Avena sativa	Seed Oats
Lolium multiflorum	Annual Rye Grass

3)      **Midwestern Short Stature Bioswale Seed Mix (WP-7)**

Approximate mix weight 72 lb/acre, with 61 native seeds/sq. ft.  
12.7% Grasses/Sedges/Rushes; 7.8% Forbs; 79.5% Temporary Cover Grasses

Scientific Name	Common Name
<i>Grasses, Sedges, and Rushes</i>	
Calamagrostis canadensis	Blue Joint Grass
Carex frankii	Frank's Sedge
Carex granularis	Meadow Sedge
Carex normalis	Spreading Oval Sedge
Carex shortiana	Short's Sedge
Carex stipata	Stalk Grain Sedge
Carex tribuloides	Blunt Broom Sedge
Carex vulpinoidea	Fox Sedge
Elymus virginicus	Virginia Wild Rye
Leersia oryzoides	Rice Cut Grass
<i>Forbs</i>	
Bidens cernua	Nodding Bur Marigold
Echinacea purpurea	Purple Coneflower
Euthamia graminifolia	Flat-top Fragrant Goldenrod
Gentiana andrewsii	Fringe-top Bottle Gentian
Lobelia siphilitica	Great Blue Lobelia
Penstemon digitalis	Foxglove Beard Tongue
Pycnanthemum virginianum	Mountain Mint
Rudbeckia fulgida	Showy Black-eyed Susan
Rudbeckia hirta	Black-eyed Susan
Tradescantia ohiensis	Ohio Spiderwort
Verbena stricta	Hoary Vervain
Zizia aurea	Golden Alexanders
<i>Temporary Cover Grasses</i>	
Agrostis alba palustris	Creeping Bent Grass
Avena sativa	Seed Oats
Lolium multiflorum	Annual Rye Grass

- D.      Weed seed content shall not exceed 0.25 percent for any variety of seed mixture.  
E.      Seed shall be mixed by the dealer. Furnish dealer's guaranteed statement of composition, mixture and percentages of purity, and germination of each variety.

PART 3.      **EXECUTION**

3.01      **SEEDBED PREPARATION**

- A.      Within all disturbed Project Areas, the surface of the topsoil shall be fine graded and prepared for seeding by removing rocks and debris larger than 2-inch diameter. All windrows shall be eliminated. Hand raking shall be performed around all structures to form smooth transitions. The entire surface shall be finished to provide positive drainage.

3.02      **SEEDING & FERTILIZING**

Portage Creek Area Time Critical Removal Action  
EQM Project Number: 030281.0087  
Specifications 02920

**KIESER & ASSOCIATES, LLC**

- A.      Contractor shall sow seed and fertilize all topsoiled restoration areas at the rates recommended by the seed supplier for each type of native seed mix specified.  
B.      Seed and fertilizer shall be applied to all General Repair Areas and Spoil Areas at the approximate rates shown below. The Contractor shall submit a certified list of the actual seed percentages used in the General Repair Areas and Stockpile Areas.  
         a.      Seed at 350 pounds per acre  
         b.      Fertilize at 500 pounds per acre of 12-12-12

3.03      **MULCHING & EROSION CONTROLS**

- A.      On the Project Areas receiving native seed mixes, the Contractor shall furnish and install mulch blankets at the locations and to the limits shown on the construction drawings. The mulch blanket shall be North American Green DS75 Straw Blankets. The Contractor shall install and anchor the mulch blankets with wood or metal stakes in accordance with the manufacturer's recommendations. Mechanical anchoring shall be performed in a manner that creates ridges perpendicular to flow of water. Where blankets are used in flow areas, the upstream end of each section shall be buried in a trench to a minimum depth of 6 inches. The Contractor shall water the mulch blanket areas at a rate of approximately 2,000 gallons per acre. Water may be obtained from the onsite creek.
- B.      Shredded straw mulch shall be applied at a rate of 2 tons per acre on the adjacent disturbed general lawn areas and spoils fill areas. Shredded straw mulch shall only be applied when wind speeds are 5 mph or less, except if approved otherwise by the Owner. The shredded straw mulch shall be anchored with a sharp-edged "crimping tool". The crimping tool shall be capable of partially cutting, embedding and anchoring the straw so it will not be blown away. The entire surface of the mulched Project shall receive two passes of the crimping tool. The second pass shall be 90 degrees to the first, unless approved otherwise by the Owner.
- C.      All soil erosion control products, including (but not limited to) silt fence, erosion control blankets, mulch netting, biostake anchoring pins, non-woven geotextile fabric, and coir logs shall be purchased from the following supplier:

**Hanes Geo Components**  
Contact: Mark Cavanaugh  
425 36<sup>th</sup> Street SW  
Wyoming, MI 49548  
Ph: (616) 530-8230  
Fx: (616) 530-2317

- D.      Minimum Erosion Control Products (as specified on the drawings).  
         1.      Straw Single Net Erosion Blankets (100% biodegradable).  
         2.      TerraTex HPG-44 Geotextile Fabric  
         3.      Ecolofence 24" Silt Fence
- E.      Additional erosion control measures shall be implemented as required to minimize silt or sediment leaving the construction site. The Contractor shall monitor and maintain all erosion control devices throughout the duration of the construction period.

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- F. All temporary erosion control devices should be in place prior to the start of construction/excavation activities, to the extent possible. The Contractor shall remove all temporary erosion control devices once full vegetation has been established.
- 3.04 MAINTENANCE
- A. Maintenance responsibilities begin immediately upon completion of seeding and planting, and shall continue for a period of 1-year. All wind, water, fire, vandalism, or natural damage that occurs during this time frame shall be repaired by the Contractor within 5 days of being notified by EQM at no additional cost to the project. Repairs shall be completed in a manner that meets the requirements of these specifications.
- 3.05 GUARANTEE
- A. It is the responsibility of the Contractor to establish and maintain a dense growth of vegetation, for a period of 1-year. All trees and shrubs shall be provided with a minimum 1-year warranty. Institute measures to protect completed landscape areas. Any part of the area that fails to show a uniform germination shall be re-seeded and such re-seeding shall continue until a dense growth is established. The Contractor shall repair damage to seeded areas resulting from erosion and/or overwatering.
- B. Replace dead or unhealthy plants with plants of the same size and species as specified. Species substitutions will not be allowed without engineer approval.

END OF SPECIFICATIONS